

VOL. VII. No. 82.

THE MARINE OBSERVER.

OCTOBER, 1930.

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## THE PRACTICAL SIDE OF THE WORK AND ITS UTILITY TO THE MERCHANT NAVY.

As we said in "Work of the Year," in the June Number we had not been able to give so much time as we should have liked to Marine Observers. But now those Conferences are over and the changes which followed them are becoming improvements, we are able to think more, again, of those who command and navigate British Ships.

Having just returned from visiting a number of the large ports in the British Isles and having again been in contact with many who are interested in Marine Meteorology, we are more convinced than ever that we cannot simplify the work too much if it is to succeed generally. At Liverpool we had the pleasure of listening to our old Conway term mate JOHN MASEFIELD, the Poet Laureate, when as President of the Conway Club he addressed Old Conways. Command of the English language, combined with true knowledge of men and things, is a great thing and though we cannot quote him word for word his expression of things nautical inspired us.

Amongst other things he told us that the success of British Seamen is due to their determination and initiative and that too much centralization and organization is apt to destroy these fine qualities.

That in fact is exactly what we have dreaded might happen to the spirit of the Corps of Voluntary Marine Observers if we did not succeed in making our organization suitable to the needs of the Service. We think that it has in fact been built so that its looseness is its strength. The fact that the work is voluntary should

guarantee that it cannot be over organized or over centralized. Work which requires such widespread united effort must be uniform and suitably organized.

The demands of the Meteorological Services most put forward of recent years have indicated a great desire for reported and recorded observations made at sea, and only some appear to have realised that the Merchant Navy had other aspects.

In Article 35 of the Convention of Safety of Life at Sea, 1929, when ratified, the Merchant Navy will have its safeguard as regards Marine Meteorology, for therein is contained an Agreement which not only requires service from shipping and seamen, but also service to them by the Meteorological Institutions of the different Countries party to the Convention. All interested in Marine Meteorology should make themselves conversant with this article of the Convention which will be found on page 212, Volume VI of THE MARINE OBSERVER. When all Countries party to the Convention are actively co-operating as laid down in Article 35, there will be little left to desire in the matter of Marine Meteorological Service.

Example is the great thing, and the proper example of the British Merchant Navy is the greatest factor.

Now that the world wide system of British "Selected Ships" Routine Wireless Meteorological reporting is being worked according to a definite schedule, information is generally available to the Merchant Navy.

At the present time the great thing is to develop the use of this broadcast information, and we ask the officers of the Merchant Navy to do all they can in collecting these reports, making weather charts from them and forming their own conclusions.

Not only should the information and knowledge gained be used for safe navigation, but at this time when shipowners are so pressed to make their ships pay, especially should every endeavour be made to promote *true* economy.

### METEOROLOGY AND THE ROYAL NAVY.

THE Royal Navy has contributed much useful information to our collection in the Marine Division. Since 1855 His Majesty's Ships have returned no fewer than 1,000 Meteorological Logs, about seven per cent. of the total received from ships of all services. Four of these Meteorological Logs were kept on board H.M.S. *Thrush* when, as Lieutenant and Commander H.R.H. Prince GEORGE, HIS MAJESTY the KING commanded that ship. Three of them were classed Excellent.

Of recent years the Royal Navy has been developing the application of Meteorology to its special needs which in many respects differ from those of the Merchant Navy. Though both services have much the same interest regarding Meteorology and Navigation, in modern gunnery as well as in aerial reconnaissance the upper winds come into calculations tremendously and whereas Meteorological work is best dealt with under a voluntary system in the Merchant Navy, it has become a recognised service duty in His Majesty's Fleet.

The Admiralty have therefore established a special form of Meteorological Log for H.M. Ships. In this log on board H.M. Ships surface observations will be entered more frequently than in the Merchant Navy and upper air observations and soundings will also be included.

Up to recently all Meteorological Logs kept in H.M. Ships were dealt with in the Marine Division in just the same way as those of the Merchant Navy. The names of the ships of the Royal Navy

Some years ago a number of commanders wrote of their experiences with Wireless and Weather as an Aid to Navigation and gave examples of fuel, time and money saved in making passages.

We hope that more will now do so, so that such experiences may be published in THE MARINE OBSERVER as an encouragement to all navigators.

who carried out voluntary Marine Meteorological work have appeared in the Voluntary Observing Fleet List in THE MARINE OBSERVER since it was established. In future, there being a special Meteorological Log for the Royal Navy, these will be dealt with by the Naval Meteorological Service Division of which Commander L. G. GARBETT, R.N., is Superintendent, and the Voluntary Observing Fleet will only be composed of ships under the Blue and Red ensigns. Captain GARBETT will pass on interesting remarks and these will continue to be published in the Marine Observer's Log in this journal.

In announcing this arrangement, which under modern conditions is far more suitable for both services than the old one, we wish to thank most heartily the Royal Navy for all its past fine Voluntary Marine Meteorological work.

That both the sea services should do their work in their own particular way, and that the interests of both services should be cared for by divisions of the Meteorological Office specially constituted for the purpose in close contact with each other, will still further help to promote and maintain the confidence and friendly co-operation between the Royal and Merchant Navies which is not only desirable for the purposes of Meteorology, but which is essential for the safety of the whole Empire.

London.

MARINE SUPERINTENDENT.

1st July, 1930.

### THE MARINE OBSERVER'S LOG.

It is hoped that these pages will be filled each month with a selection of the contributions of Mariners in manuscript, or remarks from the Logs and Reports of regular Marine Observers.

Responsibility for statements rests with the Contributor.

### CURRENTS AND NAVIGATION IN THE INDIAN OCEAN.

THE following is in reply to the Marine Superintendent's note which was published in Volume VII, No. 74.

**Captain R. H. Griffin, O.B.E., R.D., R.N.R., R.M.S. "Cathay."**

"The currents experienced by this vessel between Colombo and Fremantle during the last four years are consistent with those shown in the Admiralty Monthly Current Charts of the Indian Ocean.

"It appears to me that quarterly charts compare unfavourably with monthly ones, as the currents occasionally change appreciably during the longer period. For instance, on the Equator between Colombo and Fremantle, the monthly charts shew for February a W'ly current of 10-50 miles a day, for March a N.N.W. current of 10-45 miles a day, and for April an E'ly current of 10-50 miles daily while the quarterly chart—MARINE OBSERVER, February, 1930—shews Easterly currents throughout the three months of a velocity of about 10 miles a day. My personal experience agrees with the changes shewn by the monthly charts.

"I concur with your statement on page 38 of the February *Observer* referring to the advantage of keeping to the Westward of the rhumb line during the S.W. Monsoon."

NOTE.—These remarks appear to deal with the *mean* current arrows. The particular attention of all navigators has been invited in THE MARINE OBSERVER to the Current Roses which have been given on all ocean current charts published by the British Meteorological Office since 1924, which indicate the *variations* in current which have been experienced since 1910.

As far as possible in regions where there are marked monthly variations, monthly inset charts such as those published in the

August, 1930, Number, or curves such as are given in the new "Atlas of Currents on the Trade Routes of the North Atlantic," are given.

These sectional charts are for the purpose of providing new atlases such as that for the North Atlantic above mentioned, no current atlases prior to this having been published by Great Britain since 1897. In many parts of the Oceans, even on the trade routes, there are not sufficient observations to construct modern monthly current charts.

### ABNORMAL SET OF TIDAL CURRENT OFF CAPE MALA, PANAMA.

#### North Pacific.

THE following are observations received from S.S. *Salvador*, Captain W. H. MORGAN. Observer, Mr. R. W. GILL, 2nd Officer.

"October 16th, 1929, 1.15 p.m. (Bridge Clock), Cape Mala Lighthouse, bearing 293°, 3.5 miles, course 018°, speed set for 8.5 knots.

"Wind S., 2-3 at 1.0 p.m., backing gradually to E.S.E. 4 at 3 p.m.

"At 2.0 p.m. Cape Mala Lighthouse bore 235°, 7.75 miles. Original course and speed was maintained, and, at 3.0 p.m., Cape Mala Lighthouse bore 222°, 17.25. This latter position, with that of 1.15 p.m., gave a set 93°, drift 3.75 miles.

"High water at Cape Mala (reduced ship's time) was at 1.55 p.m., so the vessel experienced the greater part of the set during the first hour of the ebb tide.

"It is most unusual for the flood at Cape Mala to flow longer than the ebb. The ebb tide might be expected to exceed its time

of ebbing, but certainly not to have the power to put vessel in this position during the first hour.

"Ship's position was, in all cases, fixed by cross bearings. The Compass Error was carefully checked and found as allowed."

### CURRENT RIPS.

#### Gulf Stream.

THE following is an extract from the Meteorological Report of S.S. *Changuinola*, Commander R. A. THORBURN, R.D., R.N.R., West Indies to Avonmouth. Observer, Mr. V. R. WATKINS, 2nd Officer.

"From noon Thursday, 3rd October, 1929, in Latitude 43° 14' N., Longitude 42° 45' W. to 2.30 p.m. on the same day, ship's course and speed 061°, 14.0 knots on Great Circle Track, Caicoa Passage—Lundy Island, observed definite indications of presence of Gulf Stream, in the form of very pronounced current rips, and with a moderate E'ly wind the sea was so disturbed as to raise a rough sea in places, with streaks of smooth sea interspersing. No abnormal current was experienced for the day's run, the set and drift from position Latitude 43° 14' N., Longitude 42° 45' W. to Latitude 45° 53' N., Longitude 35° 58' W. being 060°, 6 miles."

### PHOSPHORESCENCE.

#### South Pacific Ocean.

THE following is an extract from the Meteorological Report of S.S. *Mataram*, Captain W. MICHIE, Sydney N.S.W. to British Solomon Islands. Observer, Mr. B. HELM, 2nd Officer.

"October 25th, 1929, in Latitude 9° 11' S., Longitude 159° 49' E. Between 2.30 a.m. and 3 a.m. (mean time longitude 160° E.) on the morning of 25th October, while passing along the South of the Island of Savo, about a mile off shore, when bound from Yandina (Russel Group) to Tulagi, Florida Islands, Solomon Islands. Observed large patches of very bright phosphorescence; about 50 in number. On approaching them, it was observed that they were not on the surface, but appeared to be down some depth. They were so bright that when passed over, or near to, they reflected on the sides of the ship, and also on approach near to or over, they appeared to expand and contract. They each appeared as one large glow and *not* as numbers of small particles. They varied in area from about 50 square yards to 10 square yards."

### SPEED OF WHALES.

#### West Coast South America.

THE following is an extract from the Meteorological Report of S.S. *Essequibo*, Captain E. ROBERTS, New York to Callao via Panama. Observer, Mr. L. MARSLAND, 4th Officer.

"October 14th, 12.30 p.m. off Lobos de Afuera, observed a large school of whales ahead. One whale came alongside, I should estimate its length at about 40 feet, and kept pace with the ship for a quarter of an hour. We were steaming at 14 kts. At 12.45 p.m. it was joined by a smaller whale and they both shot off ahead at about 17 kts."

### CLOUD PHENOMENA IN SQUALL.

#### South Pacific.

THE following is an extract from the Meteorological Log of S.S. *Karamea*, Captain A. McINTOSH, Auckland, N.Z. to Panama. Observer, Mr. K. D. FISHER, 2nd Officer.

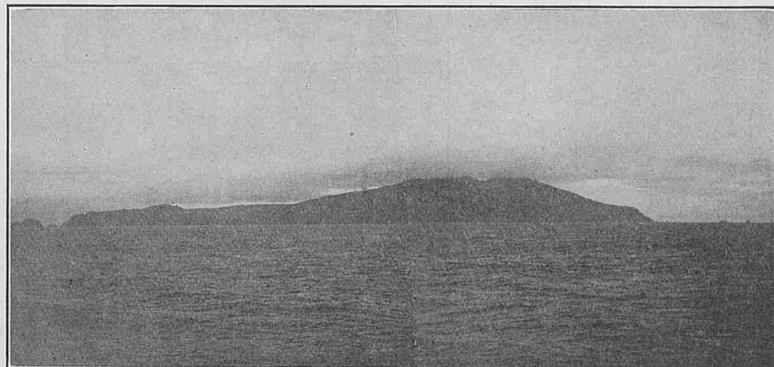
"October 19th, 1929, 4.00 p.m. (2217 G.M.T.), Latitude 16° 48' S., Longitude 112° 26' W. (Auckland to Balboa). Widespread rain-squall passing to the Southward and Eastward. In front of the squall a patch of St-Cu. moving from East at moderate speed. Low down on the horizon to the S.W. and apparently being overtaken by the squall clouds, several vertically elongated cumulus clouds. As the patch of St-Cu. approached them they all appeared to become considerably agitated, their heads inclining towards and their bases away from it. There was obviously a strong indraught towards the squall clouds (which were above the others) and the heads rapidly became attenuated as they inclined towards the horizontal, finally breaking away and joining up with the patch of St-Cu. The lower halves of the cumulus clouds resumed their normal appearances almost at once, but rounded, not vertical as before."

"It should be noted that the heads bent to windward, but the bases away from it."

### CLOUD CAP.

#### On Cocos Island.

THE accompanying photograph taken by Captain R. WILLIAMS, S.S. *Cambridge*, Balboa to Brisbane, has been received with Ship's Meteorological Log.



"Cocos Island. Latitude 5° 33' N., Longitude 87° 02' W. Bearing South (True) distant 5 miles. Wind S.S.W., force 3. October 10th, 1929."

### CLOUD FORMATION.

#### Australian Waters.

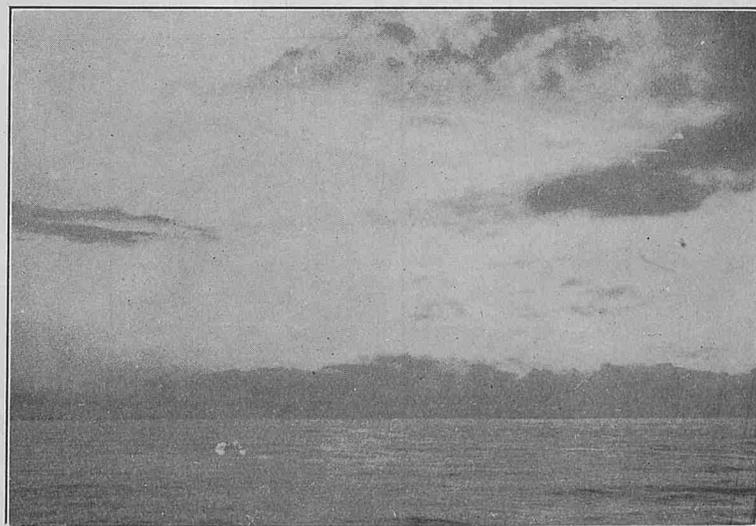
THE following is an extract from the Meteorological Report of S.S. *Moldavia*, Captain C. W. BURLEIGH, D.S.O., R.D., R.N.R., Australia to London. Observer, Mr. C. S. PIRIE, 4th Officer.

"28th November, 1929, at 5.12 p.m. L.S.T. off Cliffy Island, observed curious cloud formation in line squall. Cloud stretched from horizon to horizon in N.N.W. and S.S.E. direction and appeared to consist of two well-defined strands twisted spirally round one another, and to be turning round in horizontal axis. On passing underneath the cloud, wind shifted suddenly from N.E., force 2-3 to W.S.W., force 4-5. No rain was experienced. Barometer 29.79 in. Air Temperature 60° F."

### CLOUD PHOTOGRAPH.

#### North Atlantic.

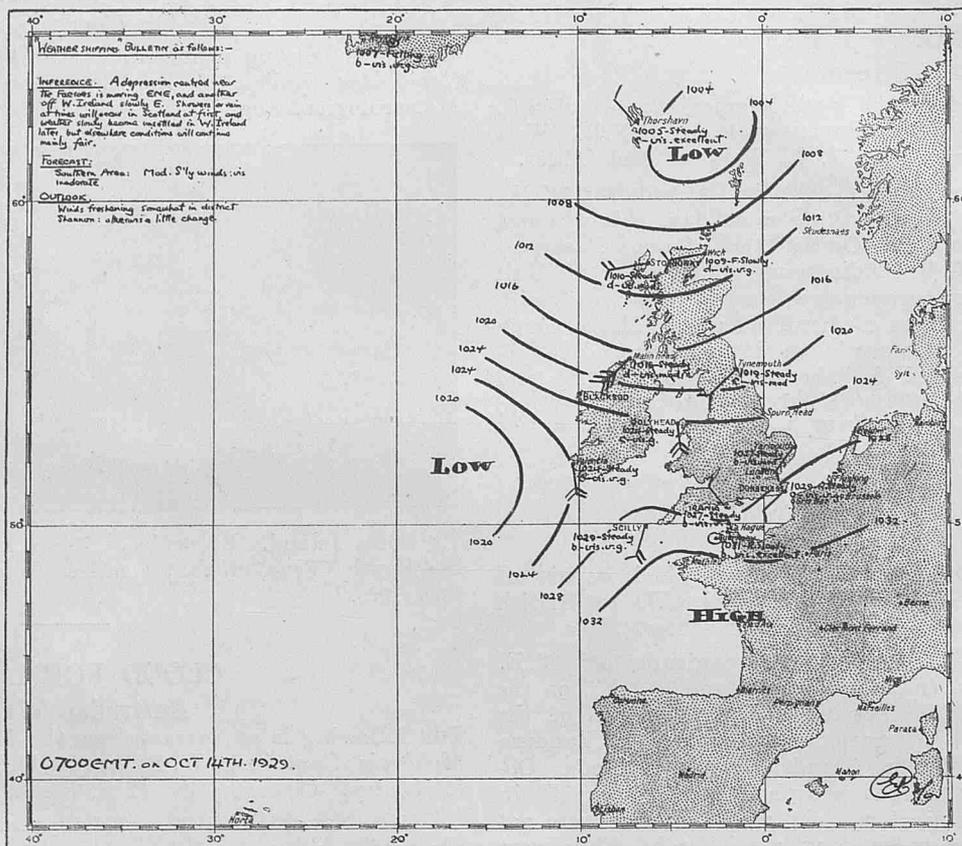
THE accompanying photograph was taken by Mr. E. B. JAMES, 2nd Officer, S.S. *Orduna*, Captain T. DANIEL, Liverpool to West Indies and West Coast of South America.



The photograph was taken on the 20th October, 1929, at 17.42 A.T.S. in Latitude 23° 07' N., Longitude 83° 00' W. Cloud, cumulus bearing 247°. Wind calm. Temperature Air 80°, Sea 83°. It was taken 8 minutes after sunset and the colouring was particularly striking."

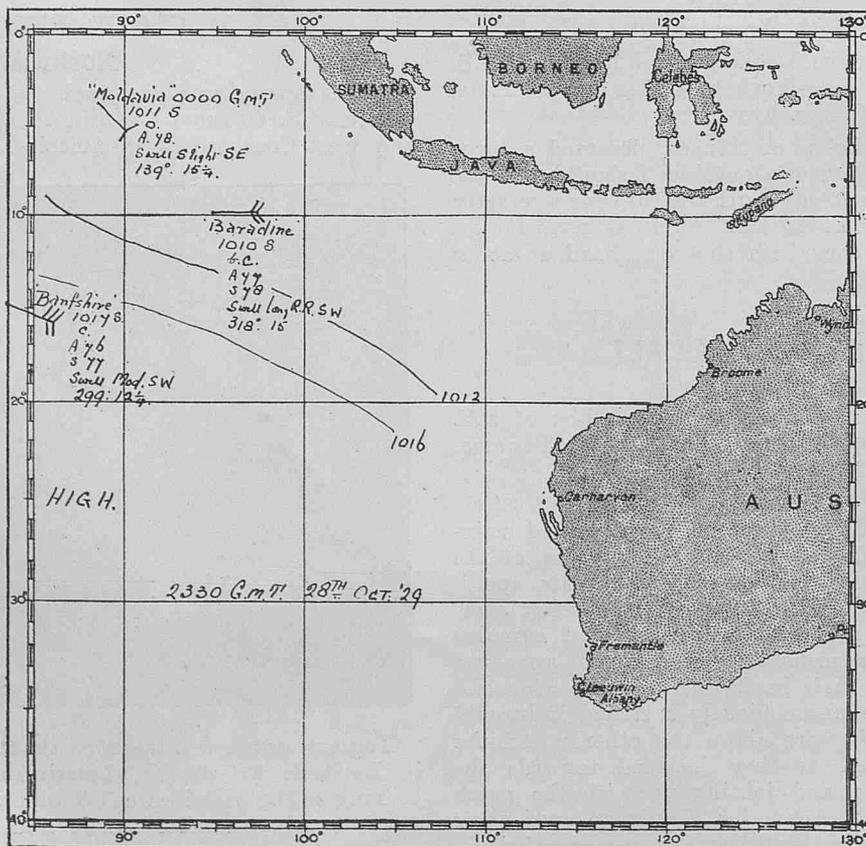
THE MARINE OBSERVER  
 WEATHER CHARTS MADE AT SEA.  
 Eastern North Atlantic.

Weather Chart (one of a series) made at sea on board M.V. *Irania*, Captain J. F. AULD, by Mr. E. ALLEN, 3rd Officer.



South-East Trade Region, South Indian Ocean.

Weather Chart (one of a series) made at sea on board S.S. *Baradine*, Captain C. H. C. ALLIN, Fremantle to Colombo, by Mr. C. B. ROCHE, Chief Officer.





## AURORA BOREALIS.

### North Atlantic.

THE following is an extract from the Meteorological Report of S.S. *Montrose*, Captain J. F. DOTY, Montreal to Antwerp. Observer, Mr. J. SOAME, 4th Officer.

"October 12th, 1929, 6.30 p.m. An unusually brilliant display of Aurora Borealis was observed. Semi-circular in shape and bright green in colour, an almost perfect arc was formed, stretching from the horizon in the N.W. to the horizon in the N.E. and reaching a maximum altitude of about 40°. From this arc long streamers (mainly bright green in colour, but occasionally red, orange and green) shot off at frequent intervals. At about 7.15 p.m. the arc commenced to break up and by 7.30 p.m. had completely disappeared, the display, however, continuing in the usual form and less brilliantly for some time. Latitude 51° 48' N., Longitude 55° 07' W. Light N'y breeze. Cloudless sky. Barometer 30.26 in. Air Temperature, 38° F., excellent visibility."

## LUNAR RAINBOW.

### Mediterranean.

THE following is an extract from the Meteorological Report of S.S. *Laomedon*, Captain J. HATFIELD, Port Said to London. Observer, Mr. O. P. H. WYNNE.

"October 11th at 20.35 A.T.S. Latitude 35° 22' N, Longitude 18° 58' E., ship passed to the southward of a large mass of nimbus and Cu-Nb. clouds from which heavy rain was falling. The southern portion of the sky was entirely free from clouds and a bright moon was shining. As we neared the line of bearing between the moon and the cloud a lunar bow was seen to form on the western end of the cloud. At first it had the appearance of a shapeless white cloud, but it gradually extended eastwards until a perfect arc of a pale whitish colour was clearly defined across the face of the cloud. This bow enclosed as an arc of the horizon of 70° from N. 10° W. to N. 60° E., with a maximum altitude of 19°. This phenomenon remained in a perfect arc for five minutes and then beginning at the western end it gradually faded from view.

"The weather at the time was wind North, 5, moderate sea and swell, with occasional heavy rain squalls and brilliant lightning. The sky was 5/10ths. covered with Cu., Cu-Nb. and Nb. clouds."

## WATERSPOUTS.

### Off Cape Rachado, Malacca Straits.

THE following account is taken from the Meteorological Log of H.M.S. *Iroquois*, Captain J. NARES, R.N., Observing Officer Sub-Lieutenant C. F. RAWNSLEY, R.N. Photographs by Lieutenant E. H. B. BAKER, R.N.

"On October 30th, 1929, when at anchor off Pyramid Shoal, we had a visit from quite a formidable collection of waterspouts. Between 7.30 and 8.30 about eight of them formed within a comparatively small area surrounding the ship. Their distance varied from 200 yards to about half a mile, and just as we were making an evolution to 'push off' out of it, two formed about 100 yards away immediately astern of the ship and started moving slowly towards us.

"The various stages in the formation of a waterspout are roughly as follows. The first indication is a slight ruffling of the surface of the water over a small area of about 50 yards diameter, which looks like the wind spilling out of a sail to leeward or small shoal of fish.

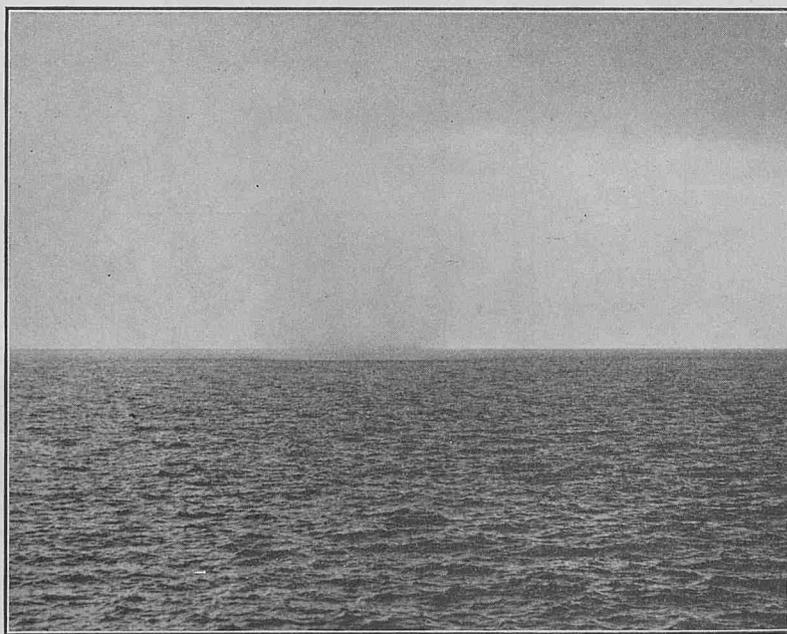
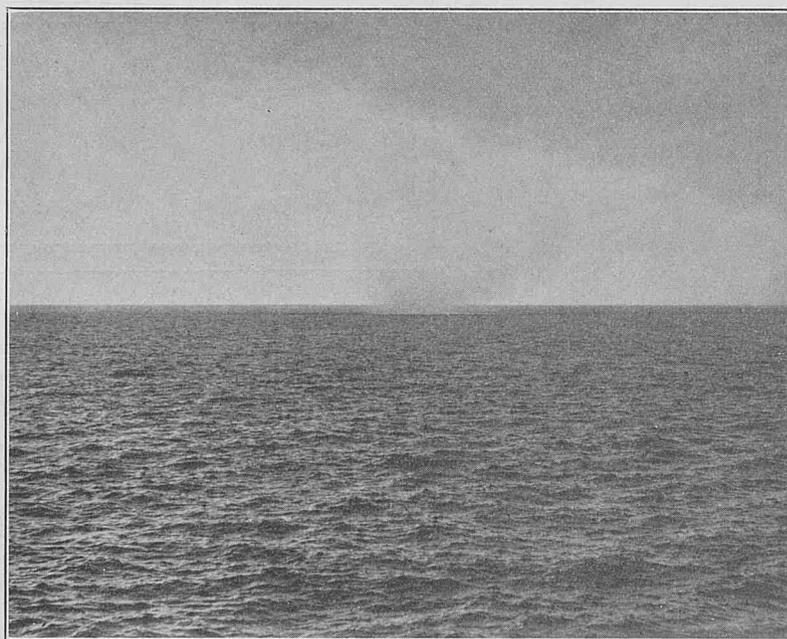
"At the same time the low lying nimbus immediately above the spot starts to move in a circle with gradually increasing velocity in a clockwise direction as one looks upwards. At the same time the crests of the ripples below begin to jump up and fly off at a tangent.

"Then an inverted cone-shaped column of rapidly revolving cloud begins to form and extends downwards until it appears to be only twenty or thirty feet from the water.

"By this time the sea has been whipped up into a veritable maelstrom underneath and clouds of spray begin to whirl round in a cup-shaped spiral with the base of the cup resting on the sea, and gradually increasing in height and diameter until the point of the inverted cone is obscured inside it. Spray flies off at a tangent in all directions and a circular patch of white water extends for many yards around.

"The appearance of the waterspout is then that of a solid column standing in a white cup, and on examining the column closely through glasses one can see that it is composed of spray and large globules of water as from a fire hose ascending in a clockwise spiral at a terrific speed.

"At this stage several things may happen. It may stay practically stationary, it may move slowly in a straight line or in a circle, or finally it may charge across the sea at 20 or 30 knots. A hollow tube may form in the centre extending throughout its whole length, which looks white compared with the grey of the column itself and the clouds in the background, and a second skin may emerge from the cloud and slowly extend downwards, surrounding the column itself like the rubber grip on a cricket bat handle but with a space between. This also is revolving (in the opposite direction, I think, but of this I am not quite sure) at high speed and may extend from a third to half of the length of the spout.



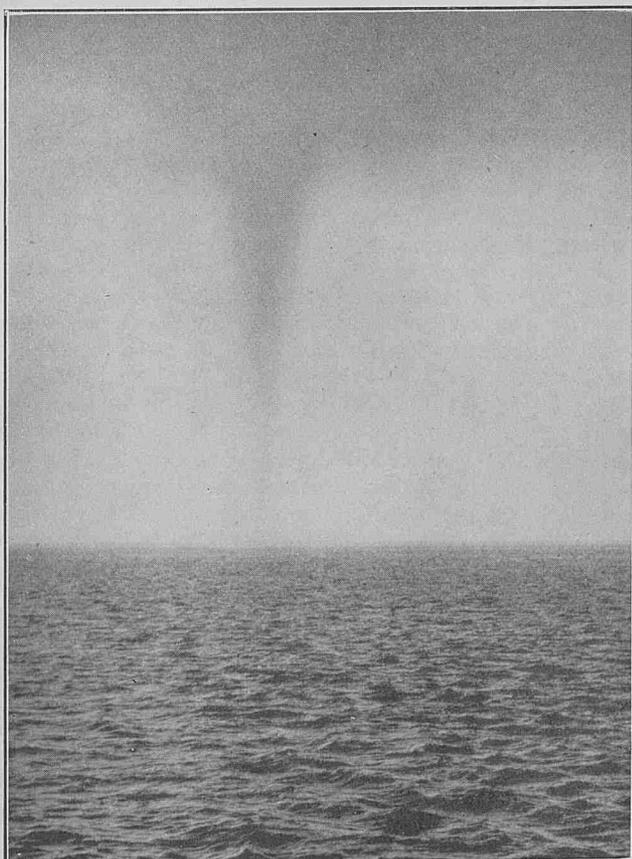
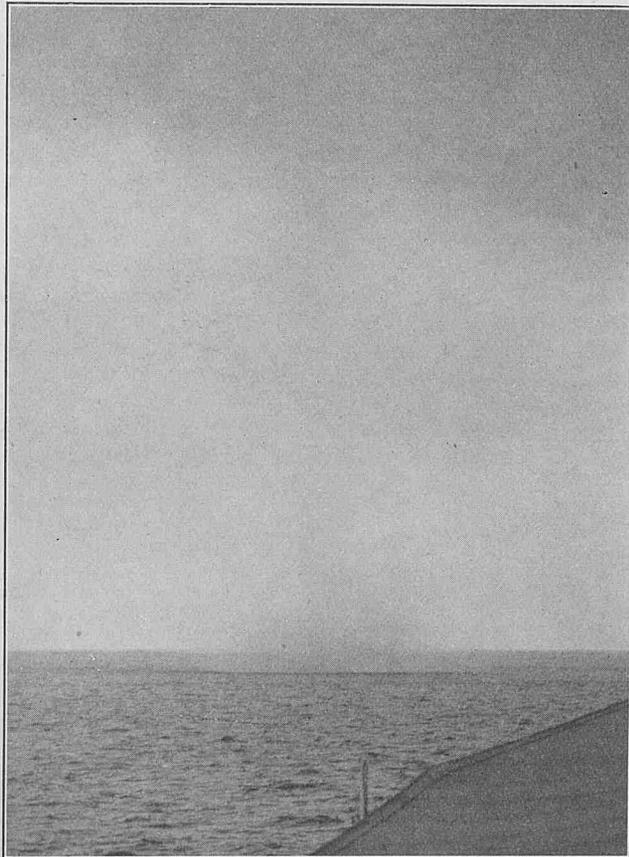
"The spout when properly formed may last from 20 minutes to half an hour, but the duration is usually shorter. It then begins to thin away and to undulate like a snake, until finally the spray cup subsides, and within 20 seconds it has completely disappeared.

"Even though we were in such close proximity to these spouts we were unable to determine (1) whether the direction of rotation was universally the same, (2) whether the spray cup revolves in the same direction as the column itself.

"The two which formed immediately astern of us drifted gradually together, when their tops joined and became one, while the smaller proceeded to pirouette around the larger.

"When the last waterspout had dissolved the clouds in the small area concerned began to discharge what looked like a solid wall of water. All round this rain storm, which remained practically stationary, was an almost flat calm sea with merely the faintest breath of wind and brilliant sunshine.

"Yet as we passed through the outskirts of one corner, the wind was so strong that we were in danger of losing some of our gear. The line of demarkation was so clearly defined that the forecastle and bridge were at one time in a squall of wind and rain of gale force, while the quarter deck was in comparative calm and sunshine."



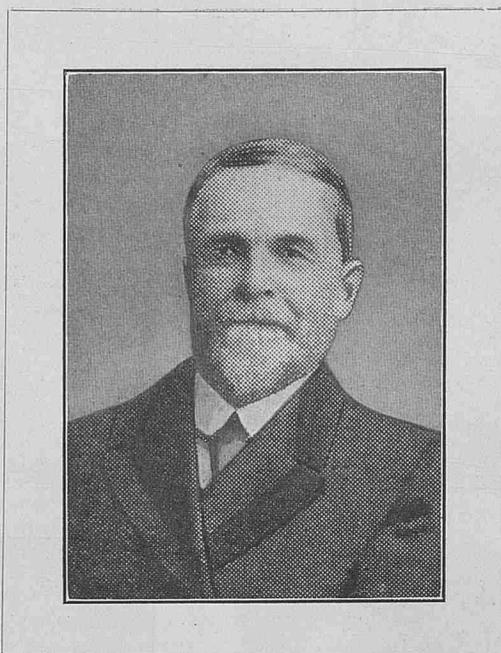
## CAPTAIN H. S. BLACKBURNE OF A, B AND C TABLES FAME.

NEXT to Captain LECKY, no British Merchant Seaman has done more to advance the science of Navigation than Captain H. S. BLACKBURNE, now resident in Wellington, New Zealand, who has recently been elected an Honorary Member of the Honourable Company of Master Mariners in acknowledgment of his signal services.

Born in 1854 at Staunton Harold, Ashby de la Zouch, Leicestershire, he went to New Zealand at the early age of five years, when

his father, the Rev. SAMUEL BLACKBURNE, was appointed Principal of St. John's College, Taranaki, Auckland, at which School he was educated.

His family returned to England in 1869, and soon afterwards, in November, 1869, young BLACKBURNE commenced his seafaring career, being bound an apprentice to Mr. W. H. TINDALL, in those days a well-known shipowner principally trading with Ceylon. His first



The Master of S.S. *Gwalior* 1894.

**CAPTAIN H. S. BLACKBURNE.**

voyage, however, was a deviation from the usual trade, and he had the experience of beating out round Cape Horn in the barque *Thames* of 450 tons on a trip to the Gulf of California. The rest of his sailing ship time was spent in the Ceylon-China trades.

In 1874 he joined the P. & O.S.N. Co. as 4th officer and remained in that Service for about 20 years, passing through the various

grades until reaching command in 1892 of S.S. *Bombay*; he commanded also the *Teheran*, *Brindisi*, *Malwa* and *Gwalior*. In 1894 Captain BLACKBURNE resigned his appointment in the P. & O.

After five years spent as a nautical coach in London, Captain BLACKBURNE was offered and accepted the post of Nautical Adviser

and Principal Examiner of Masters and Mates to the Government of New Zealand in 1899.

In 1876, when 4th officer, he commenced his calculation of the Hour Angle Tables, which were not published until shortly before the War broke out in 1914.

During the Egyptian War, in 1882, when 2nd officer of the Hospital Ship *Carthage*, BLACKBURNE became acquainted with Captain LECKY, who was in command of S.S. *British Prince*, Transport No. 46. Both being devoted to navigation, the acquaintance was kept up by correspondence, and about 1891 he gave Captain LECKY permission to include his A. B. and C. Tables in his works. These had previously been published separately in 1883.

On accepting the post of Nautical Adviser to the Government of New Zealand, Captain BLACKBURNE was not allowed to publish books on his own account, and having a 4th Edition of his tables ready for the press with several improvements, he gave all his works to the New Zealand Government, who published his books officially.

Two or three years after joining the New Zealand Government's service, Captain BLACKBURNE edited the first New Zealand Nautical Almanac and Tide Table (1930), no accurate data having previously been published.

Captain BLACKBURNE had noticed that the "New Zealand Times" and "Evening Post," Wellington's two daily newspapers, were publishing the times of sunset and sunrise as much as 20 minutes apart. He therefore wrote to the editors regarding this, but received no reply to his letter. Some months later, however, he was approached by these journals and asked if he could advise them what tables to use to obtain their astronomical data. The New Zealand Nautical Almanac and Tide Table was the result of this.

Captain BLACKBURNE was retired from the Government Post of Nautical Adviser in April, 1920, but his services were retained for a further three years to enable him to complete the Tables for Azimuth and Great Circle Sailing with improved Sumner Methods. In the recent report of the Committee on the revised examinations for Masters and Mates his tables were recommended to be supplied to examination rooms.

His principal works include:—

"The A. B. and C. Azimuth Tables,"

"The Excelsior Hour-Angle and Altitude Azimuth Tables 30 N.—30 S.,"

and "The Excelsior Ex-Meridian and position finding Tables 70° N. to 70° S."

When at sea Captain BLACKBURNE took a keen interest in Meteorology; he was a member of the British Corps of Voluntary Marine Observers from 1887 to 1894, and all 14 Meteorological Logs returned by the ships in which he served were classed "Excellent."

Among his contributions to the old Ship Masters' Society of London was a paper dealing with recommended steamship routes and winds and currents.

Captain BLACKBURNE is now living in well-earned retirement at Oriental Bay, Wellington, and carries with him the sincere good wishes of Navigators of many nations who have profited by his painstaking labours of a lifetime which have undoubtedly added to the Safety of the Navigation of millions of tons of shipping.

J. B. D.

## SOUTH PACIFIC HURRICANES.

PREPARED IN THE MARINE DIVISION BY H. KEETON, PRINCIPAL CLERICAL ASSISTANT.

Up to a few years ago the available information of Hurricanes in the South Pacific Ocean was very limited as compared with that of similar storms of the West Indies, China Seas and Indian Ocean. What information there was came from many varied sources, some fairly complete, some very fragmentary. With the development of the South Pacific as a main trade route for ships bound to and from Australasia via Panama, the subject has of recent years received greater attention; and in February, 1925, a complete, concise, and valuable summary of information was prepared by Dr. STEPHEN S. VISHNER and Mr. D. HODGE, and published by the Commonwealth Meteorological Bureau as "Bulletin No. 16—Australian Hurricanes and Related Storms, with an Appendix on Hurricanes in the South Pacific." A good deal of the information given below has been taken from that Bulletin.

**Locality.**—Hurricanes have only been reported in the western half of the South Pacific Ocean, extending from North-east and East Australia to the Low Archipelago. They are entirely unknown between the latter islands and the South American coast, and there can be little doubt that they originate amongst the tropical island groups of the Western Pacific, whence the first reports of their appearance are usually received.

The hurricanes of the South Pacific may be divided into two main groups: first, those of the islands between Longitude 160° E. and 140° W.; and, second, the Australian hurricanes, comprising those affecting Queensland and Northern Territory.

TABLE I shows the number of hurricanes of the first group reported during the various months for the period 1789 to 1924 grouped according to the region in which they were reported.

The table is based on a total of 256 hurricanes, but as some storms affected more than one group of islands, the sum of the monthly figures totals 316.

This list must not be regarded as complete, as doubtless many hurricanes occurred during the period which escaped record. According to Dr. S. S. VISHNER, it is estimated that the number of tropical cyclones affecting the island groups averages at least 12 per annum, this estimate being based on a series of years for which the information appears fairly complete.

TABLE I.

Locality.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March.	April.	May.	June.	Totals.
Fiji Islands ...	—	—	—	—	2	14	21	17	21	4	—	—	79
Tonga Islands ...	—	—	—	—	3	3	16	7	18	6	1	—	54
Samoa Islands ...	—	—	—	—	1	6	10	2	9	2	—	—	30
New Hebrides ...	—	—	—	1	2	3	11	10	9	2	1	—	39
New Caledonia...	1	—	1	2	—	4	12	12	10	2	—	—	44
Norfolk Islands...	—	1	1	2	—	—	6	8	8	3	1	2	32
Low Archipelago	—	—	1	—	—	—	3	2	1	—	—	—	7
Society Islands...	—	—	1	—	—	3	3	1	—	—	—	—	8
Solomon Islands	—	—	—	—	—	1	2	1	2	—	—	—	6
Cook Islands ...	—	—	—	—	—	5	2	6	2	2	—	—	17
Totals ...	1	1	4	5	8	39	86	66	80	21	3	2	316

**Season.**—The occurrence of hurricanes shows a marked seasonal variation in all tropical seas. In the South Pacific, as shown by Table I, the season extends from December to April inclusive, the months of greatest frequency being January to March. Storms sometimes occur in October and November, but very rarely in the remaining months of the year.

The season of the second group of hurricanes, affecting Queensland and Northern Territory, also extends from December to April, as shown by TABLE II, which gives the monthly distribution of recorded hurricanes for the periods stated.

TABLE II.

Locality.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March.	Apr.	May.	June.	Totals.
Queensland 1867-1925.	7	—	5	4	3	10	33	29	32	14	6	8	151
Northern Territory 1839-1922.	—	—	—	—	4	7	8	4	9	2	—	—	34
Totals ...	7	—	5	4	7	17	41	33	41	16	6	8	185

**Tracks.**—The hurricanes of the South Pacific generally follow a parabolic track. They first travel in a south-westerly direction from the equatorial regions, then curve southward, generally between latitude 15° S. and 25° S., and finally pass away to the south-eastward, losing their intensity and many becoming merged in the weather systems of the temperate latitudes. There are exceptions to this general direction, but, in the absence of sufficient data, the cause of these irregular tracks has not been fully explained; nor can some of these tracks have been accurately charted owing to lack of sea observations. CHART A shows the tracks of representative hurricanes selected from the list in Table I.

CHART B shows the tracks of some Australian hurricanes. Nearly all curve in a parabolic track between 15° S. and 25° S., and proceed to the south-eastward, similar to those of the island groups.

**Rate of Travel.**—The velocity of the progressive movement varies considerably with different hurricanes, and an individual hurricane may move with varying velocities at different stages of its career. Generally it may be said that the speed increases with latitude, except during recurvature. During the early life of a hurricane, the rate of travel is small, but increases to about 200 miles per day as the disturbance passes to the south-westward. On reaching the point of curvature, however, it may move very slowly or remain practically stationary, perhaps for several days; after which the speed will increase to 250 to 350 miles a day, as the storm bears away to the south-eastward. By the time they reach Latitude 30° S. the average speed is over 400 miles per day, and occasionally reaches 500-600 miles per day.

**Area.**—The area over which the influence of a hurricane is felt varies a good deal. The average extent of the stormfield may be taken as from 300 to 400 miles in diameter. In some cases it is less than 200 miles, and in others it may be as much as 800 miles, or even more. Violent or even strong winds are not to be expected, however, in the outer zones of the stormfield, although the existence of the disturbance may be plainly evident by reason of the indications of the barometer, the formation of Cirrus clouds, swell, and other signs.

**Duration.**—The duration of a hurricane depends, of course, upon its speed of travel at the particular spot where the observer is situated, and upon its extent; also, at sea, upon the course and speed of the ship relative to the storm's movement. In the vicinity of the island groups, where the storms generally recurve, the passage of a storm may occupy three or four days, the longest duration reported being six days in the district round New Caledonia. In higher latitudes, free from the islands, one day on the average covers the passage of the disturbance.

**Intensity.**—The hurricanes of the South Pacific seem to be quite as violent and destructive as those of other oceans. In spite of the limited information regarding most of the storms given in TABLE I, several of them were noted for their exceptional severity. The best known one is perhaps the "SAMOA" hurricane which visited Apia harbour on 16th March, 1889, when many vessels lying in the

harbour were either wrecked or stranded, with a loss of 130 lives. The only vessel to escape was H.M.S. *Calliope*, which steamed out to sea in the teeth of the hurricane.

Captain J. WATERHOUSE, when in command of S.S. *Glan Mackay*, sent in an account of a hurricane at Apia in March, 1923, which he described as even worse than the one in March, 1889.

**Hurricane Warning Stations.**—The hurricanes affecting the coasts of Queensland and Northern Territory are also frequently very destructive, and on several occasions coast towns have been devastated, with much loss of life and shipping. Most of these storms approach from the east, and the Commonwealth Government established, in 1921, at Willis Island, a small islet in the Coral Sea, 250 miles E. by N. of Cairns, a W/T Weather Reporting Station for the purpose of giving timely warning of these disturbances.

There was also inaugurated, during the year 1921, mainly in the interests of shipping, a scheme for the interchange between Fiji, Samoa, Tonga, New Hebrides, Cook and Norfolk Islands of meteorological information twice daily. The information from the islands is collected at Suva by Captain E. W. G. TWENTYMAN, the Harbour Master, who then compiles messages which are broadcasted from Suva W/T Station twice daily; and during the hurricane season warnings of hurricanes are broadcast as necessary. This service has proved of considerable value, and its usefulness will be still further increased when the service agreed to in Articles 34 and 35 of the Convention of Safety of Life at Sea (which includes both routine and urgent W/T weather reports from ships at sea) is fully developed.

A similar system of hurricane warning has also been adopted at Apia, and full particulars of these services are given under "Weather Signals."

### Indications of the Approach of a Hurricane.

There are certain more or less well-defined indications of the approach of a hurricane which were given in Chapter VI of "WIRELESS AND WEATHER, AN AID TO NAVIGATION."

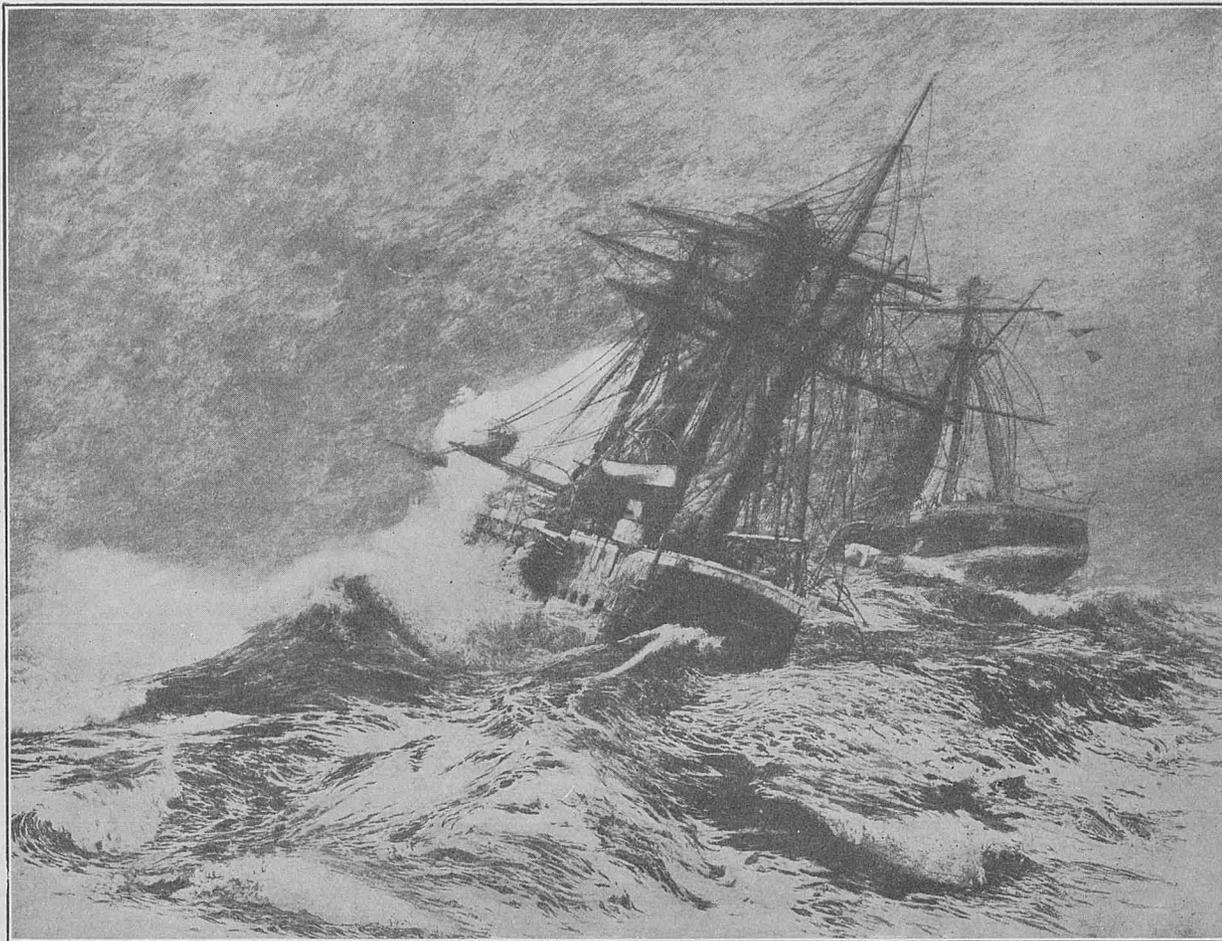
In most tropical seas where hurricanes occur a change in the predominating direction of the surface wind is nearly always the herald of an approaching hurricane. In the South Pacific, however, during the southern summer, there is no well-defined trade wind or monsoon over the hurricane regions. In winter the S.E. trade extends over practically the whole belt from Australia to South America; but this is somewhat disturbed during the summer (which is the hurricane season) between the New Hebrides and the Low Archipelago, where as a rule north-easterly or north-westerly winds alternate with light south-easterly winds and calms. Wind direction is, therefore, not always a sure guide in the South Pacific, although a north-easterly wind should always be regarded with suspicion. In any case, if an observer experiences a freshening wind with an increasing number of severe gusts and squalls, a falling barometer, and a gloomy threatening appearance of the weather, the new approach of a hurricane is certain.

### Recent Hurricanes.

During the past few years a number of reports of hurricanes in the South Pacific have been published in the Marine Observer's Log. Regarding two hurricanes which occurred on January 1st, 1926, one at Tahiti and one at Apia, Mr. A. THOMSON, Director of the Apia Observatory, remarked as follows:—

"Reports have shown that the Samoan cyclone had its origin within 5° of the Equator in the vicinity of the Union Group, Longitude 170° W., while the Papeete storm was first observed at Bora Bora, Latitude 16° 05' S., Longitude 151° 08' W.

"It would appear that in the Central South Pacific there is a tendency for two or more cyclones to develop at the same time, but quite independently of one another. On December 17th, 1925, cyclones developed simultaneously in the Ellice Group and in the Union Group, the latter proving destructive in Rarotonga after it had travelled a distance of 1,300 miles. On March 26th, 1926, a cyclone developed in the Union Islands, passed to the east of Samoa, and becoming more intense south of Latitude 15° S., started a tidal wave which devastated Palmerston Island and swept on through the Cook Group, causing damage to the foreshore at Avarua, Rarotonga. A light storm took place in the Society Islands at this time.



### Escape of H.M.S. *Calliope*

From Apia Harbour, Samoa, on the 16th March, 1889.

Reproduced from an engraving by W. L. WYLIE, A.R.A., which was presented to the Marine Division of the Meteorological Office by the late Mr. T. E. Allen.

“When the barometric pressure becomes low over a great belt lying between the Equator and  $15^{\circ}$  S., and more especially from  $5^{\circ}$  to  $10^{\circ}$ , conditions become favourable for the development of cyclones and, with the high humidity prevailing, small incidents of wind may trigger off the cyclones at more than one point. In a recent book on Cyclones in the Pacific, Dr. S. S. VISHNER mentions only three out of the total of 239 as having started within  $10^{\circ}$  of the Equator. Since three of the six occurring in the last season were well developed when crossing this parallel, it would seem that circular storms are of more frequent occurrence within  $10^{\circ}$  of the Equator than has hitherto been believed.

“The atmospherics produced by cyclones are found by the high-powered wireless station at Apia to vary greatly. During the cyclones of December 17-23, 1925, atmospherics were so bad as to prevent the receiving or transmission of messages, while during the New Year's cyclone both transmission and reception were clear and good. On March 28th atmospherics were only slightly above normal.

There were no outstanding differences in the circumstances which would explain the great variation in the electrical effects produced.”

During the 1927-1928 season, reports were made of three tropical cyclones, the earliest of which was encountered by S.S. *Makambo*, Captain T. M. BROWN, on December 30th to 31st, 1927, while on passage from Norfolk Island to Vila, New Hebrides. *Makambo's* meteorological log indicates that the storm was of moderate severity, the wind reaching force 10. *Makambo* was in the left hand semi-circle of the storm, which proceeded in a S.S.E'ly direction between Norfolk Island and the New Hebrides.

Captain TWENTYMAN, Harbour Master at Suva, Fiji, recently forwarded a report of a hurricane which passed through the centre of the Fiji Group between December 10th and 13th, 1929, the wind reaching force 11 from South at Suva, and the lowest barometer reading being 977.3 mb. (28.86 in.).



## WEATHER SIGNALS.

## I.—SHIPS' WIRELESS WEATHER SIGNALS.

Urgent Meteorological reports should be made at any time. Any ship at any time encountering a tropical revolving storm should report to all ships and the appropriate station, continuing to report at intervals of three hours so long as the ship remains under the influence of the storm.

Ships experiencing gales in which the wind reaches Force 10 or above in the Beaufort Scale should inform all ships within range.

Ships encountering Ice or other navigational dangers should report immediately to all ships and the appropriate station; see instructions for Danger to Navigation Signals for all ships, page 27, Vol. VII, No. 73.

For full particulars of "Selected Ships" Routine Meteorological Reports with Schedule for Communication, see pages 22 to 24, Vol. VII, No. 73.

See List of W/T Stations detailed to receive reports from **A Selected Ships** with particulars up to date on previous page.

In parts of the world where such stations and particulars are not given, British **A Selected Ships** should make their reports to **CQ** on 2100 metres (143 kc/s) as stated on page 24, Vol. VII, No. 73 (January, 1930, MARINE OBSERVER).

**B Selected Ships** when within range of stations ringed in on Chart XI, in making their reports to **CQ** should make special endeavour to ensure that the report is received at these shore stations.

According to agreement reached by the International Meteorological Conference, 1929, all arrangements for the co-operation of shipping in Voluntary Marine Meteorological work are to be made through the Meteorological Services of the different countries in which the ships are registered in accordance with the agreed upon International plan for all parts of the World.

## II.—WIRELESS WEATHER SIGNALS.

## WIRELESS WEATHER BULLETINS.

## Australia.

## C.W., I.C.W. and Spark Issues.

WEATHER reports and forecasts issued by the Commonwealth Meteorological Bureau are broadcast *en clair* by Australian W/T stations as follows, special reports and warnings being broadcast immediately on receipt by the W/T Stations serving the area affected, when dangerous weather prevails or is expected.

## Perth W/T Station.

Approximate, Latitude 32° 02' S. Longitude 115° 49' E.

Call sign, **VIP**. Wavelength 600 metres (I.C.W.).

At 0415 and 1100 G.M.T., Mondays to Saturdays, inclusive, weather forecasts are broadcast.

Each forecast is for the following 24 hours, except on Saturdays when it is for 48 hours.

At 0415 and 1100 G.M.T., on Sundays, supplementary forecasts for the following 24 hours are broadcast.

In addition to the above, 0100 and 0700 G.M.T. observations of barometric pressure, wind direction and force, weather, and state of the sea at Fremantle and Cape Leeuwin on week-days and 0100 and 1000 G.M.T. observations of the same elements on Sundays, are broadcast. Other coastal reports and reports from shipping are included when necessary.\*

At 0030 G.M.T., on 2,400 metres (C.W.), weather forecast of the previous evening is broadcast for the information of distant shipping.

## Geraldton W/T Station.

Approximate, Latitude 28° 47' S. Longitude 114° 36' E.

Call sign, **VIN**. Wavelength 670 metres (spark).

At 0200 and 1200 G.M.T., Mondays to Fridays, inclusive, weather forecasts for the following 24 hours are broadcast.

At 0200 G.M.T. on Saturdays, a weather forecast for the following 48 hours is broadcast.

In addition to the above 0000 and 0600 G.M.T. observations of barometric pressure, wind direction and force, weather and state of the sea, at Fremantle and Cape Leeuwin are broadcast, Mondays to Fridays; 0000 G.M.T. observations on Saturdays; 0000 and 0900 G.M.T. observations on Sundays.\*

## Broome W/T Station.

Approximate, Latitude 17° 58' S. Longitude 122° 14' E.

Call sign, **VIO**. Wavelength 600 metres (spark).

Weather forecasts are broadcast at 1400 G.M.T.\*

From 16th April to 16th December no separate forecast is broadcast for Sundays; the forecast issued on Saturdays is therefore for the following 48 hours.

## Wyndham W/T Station.

Approximate, Latitude 15° 27' S. Longitude 128° 07' E.

Call sign, **VIW**. Wavelength 720 metres (I.C.W.).

At 0130 and 1130 G.M.T., Mondays to Fridays, inclusive, weather forecasts for the following 24 hours are broadcast.\*

At 0130 G.M.T. on Saturdays, a weather forecast for the following 48 hours is broadcast.

## Darwin W/T Station.

Approximate, Latitude 12° 27' S. Longitude 130° 50' E.

Call sign, **VID**. Wavelength 600 metres (spark).

At 1200 G.M.T., broadcasts a 24 hours Weather forecast for the N.W. coast of Western Australia, Gulf of Carpentaria and E. coast of Queensland. From 16th December to 16th April the 2300 G.M.T. weather report for the coast of Queensland, and a forecast for the ensuing 24 hours, are issued by Brisbane Weather Bureau on Sunday mornings. During the remainder of the year Sunday forecasts are suspended and the forecast broadcast on Saturdays is therefore for the following 48 hours.

## Thursday Island W/T Station.

Approximate, Latitude 10° 35' S. Longitude 142° 13' E.

Call sign, **VII**. Wavelength 720 metres (I.C.W.). Ships may obtain the 0500 G.M.T. weather report for the coast of Queensland and a forecast for the ensuing 24 hours upon application to the above W/T Station.

## Cooktown W/T Station.

Approximate, Latitude 15° 28' S. Longitude 145° 16' E.

Call sign, **VIC**. Wavelength 760 metres (spark).

Ships may obtain weather information similar to above (Thursday I.) upon application to Cooktown W/T Station.

## Townsville W/T Station.

Approximate, Latitude 19° 16' S. Longitude 146° 50' E.

Call sign, **VIT**. Wavelength 2,400 metres (C.W.).

\* When available, the 0000 G.M.T. observations of barometric pressure, wind and weather at Kupang (Timor) are also broadcast from the above four stations.

At 1100 G.M.T. The 0500 G.M.T. weather report for the coast of Queensland and a forecast for the following 24 hours is broadcast daily, except Sundays.

At 1100 G.M.T. on Sundays, from 16th December to 16th April, only, the 2300 G.M.T. weather report for the coast of Queensland, and a 24 hours' forecast issued by the Brisbane Weather Bureau are broadcast. If an atmospheric disturbance is reported the broadcast is made immediately upon receipt of the information from the Weather Bureau. The forecasts on Saturdays from 16th April to 16th December are for the ensuing 48 hours.

#### Willis Islets W/T Station.

Approximate, Latitude 16° 18' S. Longitude 149° 59' E.

Call sign, **VIQ.** Wavelength 730 metres (spark).

From about mid November to 30th April this W/T station broadcasts particulars of barometric pressure, wind direction and force, amount of cloud, weather, state of sea and swell at Willis Island, *en clair*, as follows:—

At 0645 G.M.T., containing observations of 0600 G.M.T.

At 1045 G.M.T., " " " 0800 "

At 2330 G.M.T., " " " 2200 "

During stormy weather the 1045 G.M.T. broadcast will contain 1000 G.M.T. observations.

#### Rockhampton W/T Station.

Approximate, Latitude 23° 25' S. Longitude 150° 31' E.

Call sign, **VIR.** Wavelength 720 metres (spark).

Ships may obtain the 0500 G.M.T. weather report for the coast of Queensland and a forecast for the ensuing 24 hours, upon application to the above W/T Station.

#### Brisbane W/T Station.

Approximate, Latitude 27° 26' S. Longitude 153° 07' E.

Call sign, **VIB.** Wavelength 600 metres (I.C.W.).

Between 0200 and 0230 G.M.T., broadcasts, the 2300 G.M.T. coastal weather report and a 6 hours' forecast. Ships can also obtain this information on request.

At about 1200 G.M.T. daily (except Sundays), or earlier if requested, the 0500 G.M.T. coastal weather report and a forecast for the ensuing 24 hours are broadcast. On Saturday the forecast is for 48 hours.

#### Sydney W/T Station.

Approximate, Latitude 33° 46' S. Longitude 151° 03' E.

Call sign, **VIS.** Wavelengths as given below.

Between 2300 and 0030 G.M.T. this W/T station broadcasts on a wavelength of 600 metres (I.C.W.) a 2300 G.M.T. weather report of coastal conditions and a 24 hours' forecast if the Weather Bureau is in receipt of sufficient information in time; if not, the report and forecast will be broadcast between 0200 and 0300 G.M.T. on a wavelength of 2,400 metres (C.W.). The foregoing broadcasts are made daily, except Sundays.

At 1030 G.M.T., repeated at 2230 G.M.T., on wavelengths of 2,400 metres (C.W.) and 600 metres (I.C.W.), respectively, a summary of the coastal weather reports and a 24 hours' forecast are broadcast. Ships may also obtain this information on application to Sydney W/T Station after 0630 G.M.T. daily, except on Saturdays and Sundays. On Sundays at 1030 G.M.T., repeated at 2230 G.M.T., a 24-hour forecast and coastal weather report are broadcast on 2,400 metres (C.W.) and 600 metres (I.C.W.) respectively.

#### Melbourne W/T Station.

Approximate, Latitude 37° 47' S. Longitude 144° 52' E.

Call sign, **VIM.** Wavelength 600 metres (I.C.W.).

At 0200 G.M.T. (1) The 2300 G.M.T. observations of barometric pressure, wind direction and force, weather, state of the sea at Cape Borda, Cape Northumberland, Wilson's Promontory, Bruni Island and Jervis Bay. Reports from other coastal stations or from ships

are on occasion broadcast in lieu of reports from one or more of the usual stations, or may be supplied in addition thereto.

(2) Brief information regarding any disturbance affecting, or likely to affect, weather in the Great Australian Bight, south-eastern Australian waters, or the Tasman Sea.

(3) A forecast for the ensuing 24 hours.

The foregoing broadcasts are made daily except on Sundays.

At 1100 G.M.T. daily, including Sundays, a weather forecast for the ensuing 24 hours is broadcast. In special circumstances this forecast is accompanied by reports from selected coastal stations.

#### Flinders Island W/T Station.

Approximate, Latitude 40° 01' S. Longitude 147° 54' E.

Call sign, **VIL.** Wavelength 740 metres (I.C.W.).

Soon after 2300 G.M.T. broadcasts the 2300 G.M.T. observations of barometric pressure, wind direction and force, weather, state of the sea in code.\*

#### King Island W/T Station.

Approximate, Latitude 39° 56' S. Longitude 143° 52' E.

Call sign, **VIK.** Wavelength 760 metres (I.C.W.).

Transmits weather report on request.

#### Hobart (Tasmania) W/T Station.

Approximate, Latitude 42° 52' S. Longitude 147° 19' E.

Call sign, **VIH.** Wavelength 720 metres (I.C.W.).

Ships may obtain a summary of 2300 G.M.T. coastal weather reports on application to the W/T Station, after about 0030 G.M.T., daily (Sundays excepted). A 24 hours' forecast may also be obtained on application after about 0330 G.M.T. The forecast issued on Saturdays is for the ensuing 48 hours.

#### Adelaide W/T Station.

Approximate, Latitude 34° 51' S. Longitude 138° 32' E.

Call sign, **VIA.** Wavelength 600 metres (I.C.W.).

Ships may obtain a summary of 2330 G.M.T. coastal weather reports and a 24 hours' forecast on application to the W/T Station, after 0200 G.M.T. daily, except on Sundays.

A later forecast is broadcast at 1130 G.M.T. for the following 24 hours preceded by a statement of meteorological conditions at 0530. On Saturdays the forecast is for 48 hours and the statement omitted.

#### Esperance W/T Station.

Approximate, Latitude 33° 52' S. Longitude 121° 54' E.

Call sign, **VIE.** Wavelength 680 metres (spark).

At 0300 and 1300 G.M.T., Mondays to Fridays, inclusive; Saturdays at 0300 only; broadcasts weather forecasts for the following 24 hours. Saturday's forecast is for the following 48 hours.

In addition to the forecasts, observations of barometric pressure, wind direction and force, weather, state of the sea at Fremantle and Cape Leeuwin are broadcast. These observations are taken at 0100 and 0700 G.M.T., Mondays to Fridays; at 0100 G.M.T. on Saturdays; and at 0100 and 1000 G.M.T. on Sundays.

#### British New Guinea (Papua).

(C.W. and Spark Issues.)

#### Port Moresby W/T Station.

Approximate, Latitude 9° 28' S. Longitude 147° 09' E.

Call sign, **VIG.** Wavelength 720 metres (spark).

\* No information is available up to time of going to press as to changes of Key Letters or Code, following the Conference of Safety of Life at Sea, 1929, and the International Meteorological Conference at Copenhagen, 1929.

Soon after 2300 G.M.T., daily. The 2300 G.M.T. observations of barometric pressure, temperature (dry and wet bulb, maximum and minimum) amount of rainfall, wind direction and force, state of the sea, are transmitted in code.\* Ships may obtain the 0500 G.M.T. weather report for the coast of Queensland and a 24 hours' forecast on application to the W/T Station.

**Samarai W/T Station.**

Approximate, Latitude 10° 37' S. Longitude 150° 40' E.

Call sign, **VIJ**. Wavelength 720 metres (spark).

Soon after 2300 G.M.T., the 2300 G.M.T. observations of barometric pressure, wind direction and force, and weather, are transmitted in code.\* Ships may obtain a weather forecast on application to the W/T Station.

**New Britain—Rabaul (Bitapaka) W/T Station.**

Approximate, Latitude 4° 24' S. Longitude 152° 19' E.

Call sign, **VJZ**. Wavelength 2,400 metres (C.W.).

At about 0600 G.M.T., daily. The 2300 G.M.T. weather report for the coast of Queensland and a 24 hours' forecast are broadcast. Ships may also obtain this information on application to the W/T Station. From 16th April to 16th December, no forecast is broadcast on Sundays; the forecast issued on Saturdays is therefore for 48 hours.

**New Zealand.**

(I.C.W. Issue.)

**Wellington W/T Station**, Latitude 41° 16' S., Longitude 174° 46' E. (approximate), call sign **ZLW**., now issues a general weather bulletin† at 0930 G.M.T. on a wavelength of 600 metres (I.C.W.).

The message contains a general statement of the weather systems affecting New Zealand waters, forecasts for New Zealand, New Zealand waters and the Tasman Sea, followed by reports from the 17 stations given below, containing observations of barometric pressure in inches, air temperature in degrees F., wind direction and force, weather by Beaufort notation and the state of the sea, in plain language.

Station.	Position (approx.).	
	Latitude.	Longitude.
Norfolk Island ... ..	29° 04' S.	167° 58' E.
Awanui ... ..	37° 50' S.	178° 27' E.
Auckland ... ..	36° 50' S.	174° 50' E.
East Cape ... ..	37° 42' S.	178° 33' E.
Cape Egmont ... ..	39° 17' S.	173° 46' E.
Napier ... ..	39° 29' S.	176° 55' E.
Farewell Spit ... ..	40° 33' S.	173° 01' E.
Stephens Island ... ..	40° 40' S.	174° 01' E.
Wellington ... ..	41° 17' S.	174° 46' E.
Cape Campbell ... ..	41° 43' S.	174° 17' E.
Greymouth ... ..	42° 26' S.	171° 13' E.
Akaroa Lighthouse ... ..	43° 49' S.	172° 59' E.
Nugget Point ... ..	46° 27' S.	169° 51' E.
Puysegur Point ... ..	46° 10' S.	166° 38' E.
Chatham Islands ... ..	43° 52' S.	176° 42' E.
Sydney ... ..	33° 52' S.	151° 12' E.
Hobart ... ..	42° 53' S.	147° 20' E.

\* No information is available up to time of going to press as to changes of Key Letters or Code, following the Conference of Safety of Life at Sea, 1929, and the International Meteorological Conference at Copenhagen, 1929.

† Marine Observers report that the time of observations used in this Bulletin appears to be 0430 G.M.T.

**South Pacific Ocean Islands.**

**Fiji Islands.**

**Suva W/T Station**, approximate Latitude 18° 09' S., Longitude 178° 28' E., call sign **VPD**, broadcasts a weather bulletin, containing observations taken at 0330 and 2030 G.M.T., at the following stations, on a wavelength of 600 metres (I.C.W.), directly after the Apia broadcast (see below) at 0845 and 2345 G.M.T., Sundays 0845 only:—

	Latitude (approx.).	Longitude (approx.).
Apia, Samoa ... ..	13° 51' S.	171° 48' W.
Nukualofa (Tonga Islands) ... ..	21° 08' S.	175° 12' W.
Fila (New Hebrides) ... ..	16° 00' S.	168° 00' E.
Norfolk Island ... ..	28° 58' S.	168° 03' E.
Suva (Fiji Islands) ... ..	18° 09' S.	178° 28' E.
Awanui (New Zealand) ... ..	35° 05' S.	173° 15' E.
Vavau (Tonga Islands) ... ..	18° 39' S.	173° 59' W.
Rarotonga (Cook Islands) ... ..	21° 12' S.	159° 48' W.
Papeete ... ..	17° 29' S.	149° 29' W.

NOTE.—Only the 0330 G.M.T. observations are included from Rarotonga and Papeete.

The bulletin is sent *en clair* and consists of:—

- Name of the observation station.
- Barometric reading (corrected) in inches and hundredths.
- Dry and wet bulb thermometer readings (in whole degrees F.).
- Direction (True) and force of the wind (Beaufort Scale).
- State of weather by Beaufort Scale.

Example:—

Suva 30.08 79 75 E.N.E. 5 or, break sign (— — — —)

Apia 30.16 80 78 E.N.E. 3 bc, break sign

Nukualofa, etc., etc., the bulletin ending with the observation time, 0330 or 2030 G.M.T., as the case may be.

**Samoa.**

**Apia W/T Station**, approximate Latitude 13° 51' S., Longitude 171° 48' W., call sign **ZMA**, broadcasts a similar bulletin to that explained above at 0830 and 2330 G.M.T. on a wavelength of 800 metres (I.C.W.) (Sundays excepted).

**During the period May 1st to October 31st.**

Only one bulletin is broadcast by Apia at 0830 G.M.T. containing observations taken at 0330 G.M.T.

**WIRELESS STORM WARNINGS.**

**Australia.**

(C.W., I.C.W. and Spark Issues.)

Storm warnings are broadcast by the Australian W/T stations as follows:—

For approximate positions of the Stations *see* pp. 230–1.

**Perth**, call sign **VIP**, wavelengths 600 metres (I.C.W.) and 2400 metres (C.W.).

**Geraldton**, call sign **VIN**, wavelength 670 metres (spark).

**Broome**, ,, **VIO**, ,, 600 ,, ,,

**Wyndham**, ,, **VIW**, ,, 720 metres (I.C.W.).

These W/T Stations broadcast special warnings of the approach of cyclonic storms of tropical origin, including information regarding barometric pressure at stations on the N.W. coast of W. Australia, immediately upon receipt from the Weather Bureau.





**Numbers representing Ports:**

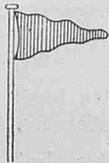
- |                        |                          |                   |
|------------------------|--------------------------|-------------------|
| 10. Torres strait.     | 50. Portland bay.        | 80. Keppel bay.   |
| 11. Cleveland bay.     | 51. South Australia.     | 81. Port Denison. |
| 37. Wilson promontory. | 52. King George sound.   | 82. Wollongong.   |
| 40. Sydney.            | 53. Western Australia.   | 83. Wide bay.     |
| 41. Moreton bay.       | 54. Launceston.          | 84. Port Curtis.  |
| 42. Clarence river.    | 55. Hobart.              | 88. Port Fairy or |
| 43. Port Macquarie.    | 56. Gulf of Carpentaria. | Warrnambool.      |
| 44. Port Stephens.     | 61. Shoalhaven.          | 97. Hawke bay.    |
| 45. Newcastle.         | 68. Richmond river.      | 98. Kiama.        |
| 46. Jervis bay.        | 70. Macleay river.       | 99. Wallaroo.     |
| 47. Twofold bay.       | 72. Gabo island.         | 01. Port Mackay.  |
| 48. Corner inlet.      | 75. Manning river.       | 02. Queensland.   |
| 49. Port Phillip.      | 76. Circular head.       |                   |

NOTE.—Other numbers signify ports outside the eastern colonies from which a vessel arrives; they are not inserted as they would not be used for storm signals.

These signals are also used to indicate the place from which a vessel arrives.

**Queensland.**

A red pennant is hoisted at the various ports and lighthouse signal stations on receipt of a storm-warning.



*Red Pennant.*

Indicates that a weather report concerning a tropical disturbance or a storm warning is available. (See below.)

Information may be obtained from the postmaster or harbour officials.

**New Zealand.**

Storm signals are exhibited from the following Lighthouses: Cape Maria Van Diemen, Tiri Tiri Matangi, Cape Campbell, Farewell Spit, Nugget Point, and Stephens Island. They are not to be considered as covering a distance greater than 200 miles from the place at which they are hoisted, those hoisted with the red pennant below as covering only a distance of 50 miles from the place at which they are hoisted.

**Symbols used and their Meanings.**

- 

Northerly gales. Hoisted when strong winds or gales are probable from N., that is, from about N.E., changing through north towards west.  
NOTE.—This change of wind is usually followed by strong winds or gales from the southward.
- 

Westerly gales. Hoisted when strong winds or gales are probable from W., that is from about N., changing through W. towards S.W.  
NOTE.—After these gales have moderated the wind generally shifts to N.W. or to N.
- 

Easterly gales. Hoisted when strong winds or gales are probable from E., that is, from about N., changing towards E. and S.E.  
NOTE.—This change of wind denotes a "black North-Easter" and an approaching cyclone.
- 

South-easterly gales. Hoisted when strong winds or gales are probable from E., changing, through S., towards S.W.
- 

Southerly gales. Hoisted when strong winds or gales are probable from about W., changing, through S., towards S.E.
- 

Unusual gales. Hoisted when strong winds or gales are probable from about S., changing, through E., towards N.

MODERATE WEATHER is indicated by the International code signals, but only in reply to inquiry and if meteorological conditions admit.

NOTE.—(1) A red pennant hoisted below any of the above signals made between the hours of 8 a.m. and noon indicates that the signal refers to the previous day.

(2) Signals hoisted without the red pennant refer to the day on which they are hoisted.

(3) The red pennant when hoisted alone, indicates that the forecast for the day has not been received at the station from the Meteorological Office, Wellington.

(4) Whenever the wind at any of the signal stations has changed in such manner that the forecast for the previous day will not apply no signal is displayed until the forecast for the day has been received at the station.

(5) When it is observed that the storm signals are not being shown at a storm signal station, the Dominion meteorological forecast for the same day may be obtained by hoisting the signal ZK

**South Pacific Ocean Islands.**

**Fiji Islands.**

During the hurricane season (from November 1st to April 30th) storm signals as defined below will be exhibited at the signal station, Suva, and at the Government Wharf, to denote that a dangerous depression in the atmospheric pressure appears to be approaching the group. The signals will be displayed until conditions improve.

Between sunrise and sunset: Two black circles disposed vertically.

Between sunset and sunrise: Two red lights disposed vertically.

At the Wharf, Suva, attention will be drawn to the first exhibition of the signals by a detonator being fired twice, with an interval of one minute.

Weather reports are posted up outside the Harbour Master's office during the hurricane season.

**Special Notices Regarding Personnel**

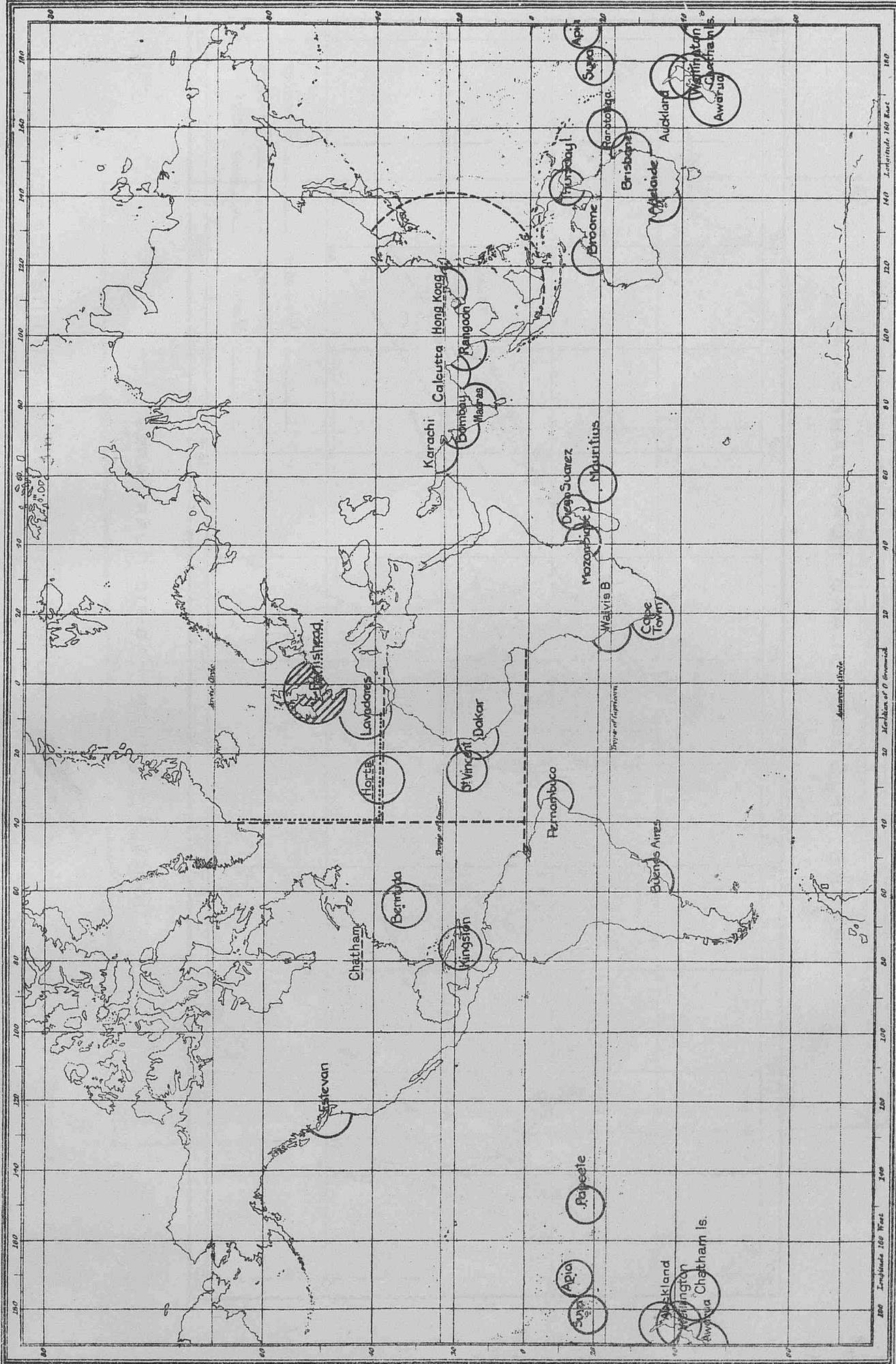
*The Marine Superintendent will be glad to receive information of special distinctions gained and retirements, &c., of Marine Observers.*

**Lieutenant-Commander W. M. Porterfield, R.N.R.**

Captain W. M. PORTERFIELD, now in command of the *Clan Morrison*, has recently been appointed Commodore of the Clan Line Fleet.

Captain PORTERFIELD has been in the service of the Clan Line for the past 40 years, and has been associated with the Corps of Voluntary Marine Observers since 1903.

Chart XI.— SHIPS' WIRELESS WEATHER SIGNALS.  
Stations for Reception of Routine Wireless Weather Reports from "Selected Ships."



The dotted line indicates the area in which British "Selected Ships" report under control to Portishead. The small shaded circle indicates the area from which reports are prohibited to Portishead.

A pecked line indicates the reporting area round stations in other countries to which British "Selected Ships" should report. The names of such stations being also underlined with a pecked line.

The full-line circles indicate the areas round islands and coast stations which could receive spank Selected Ships' reports to C.Q.



TRACKS OF SOME ISLAND HURRICANES.

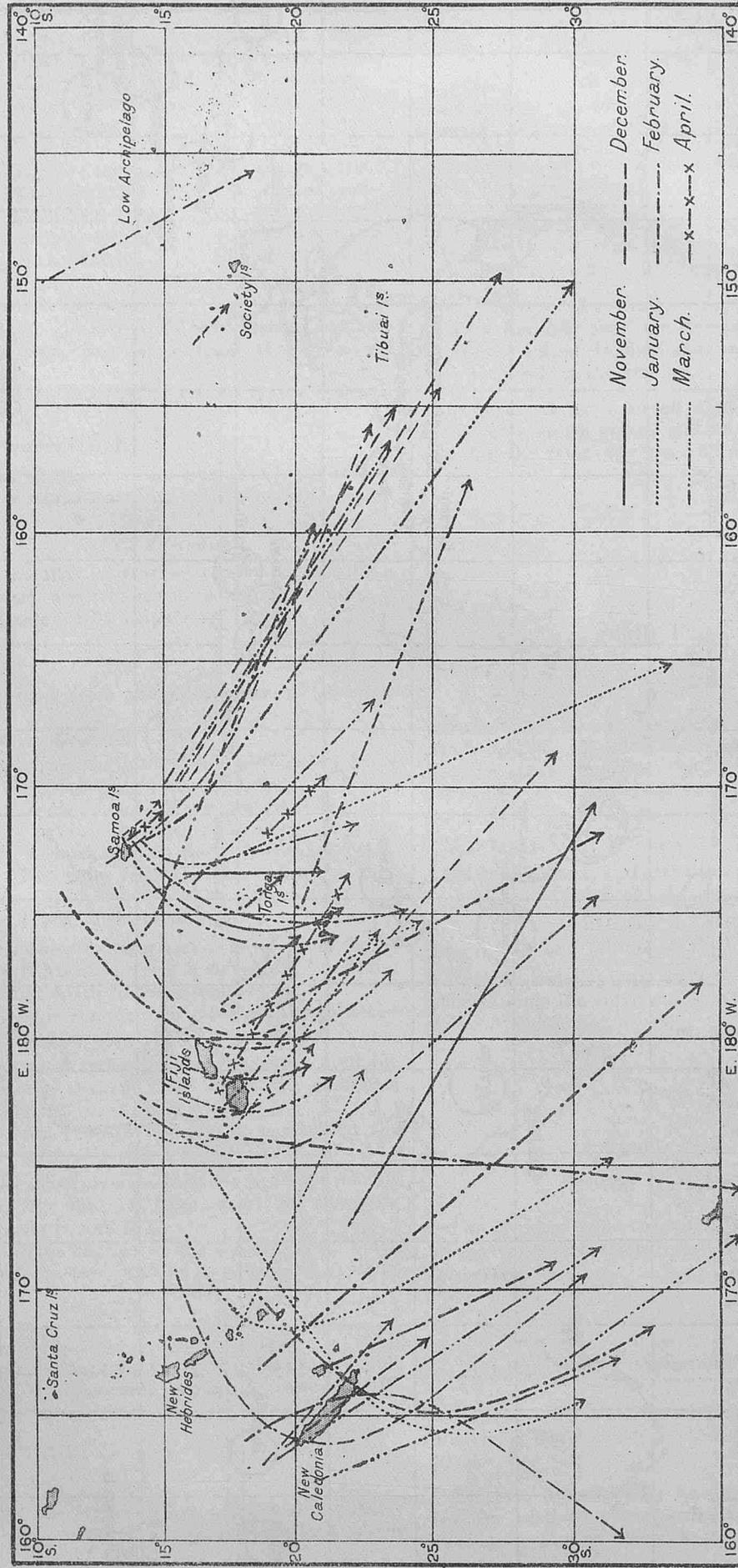


Chart. A.—“SOUTH PACIFIC HURRICANES.”

TRACKS OF SOME QUEENSLAND AND NORTHERN TERRITORY HURRICANES.

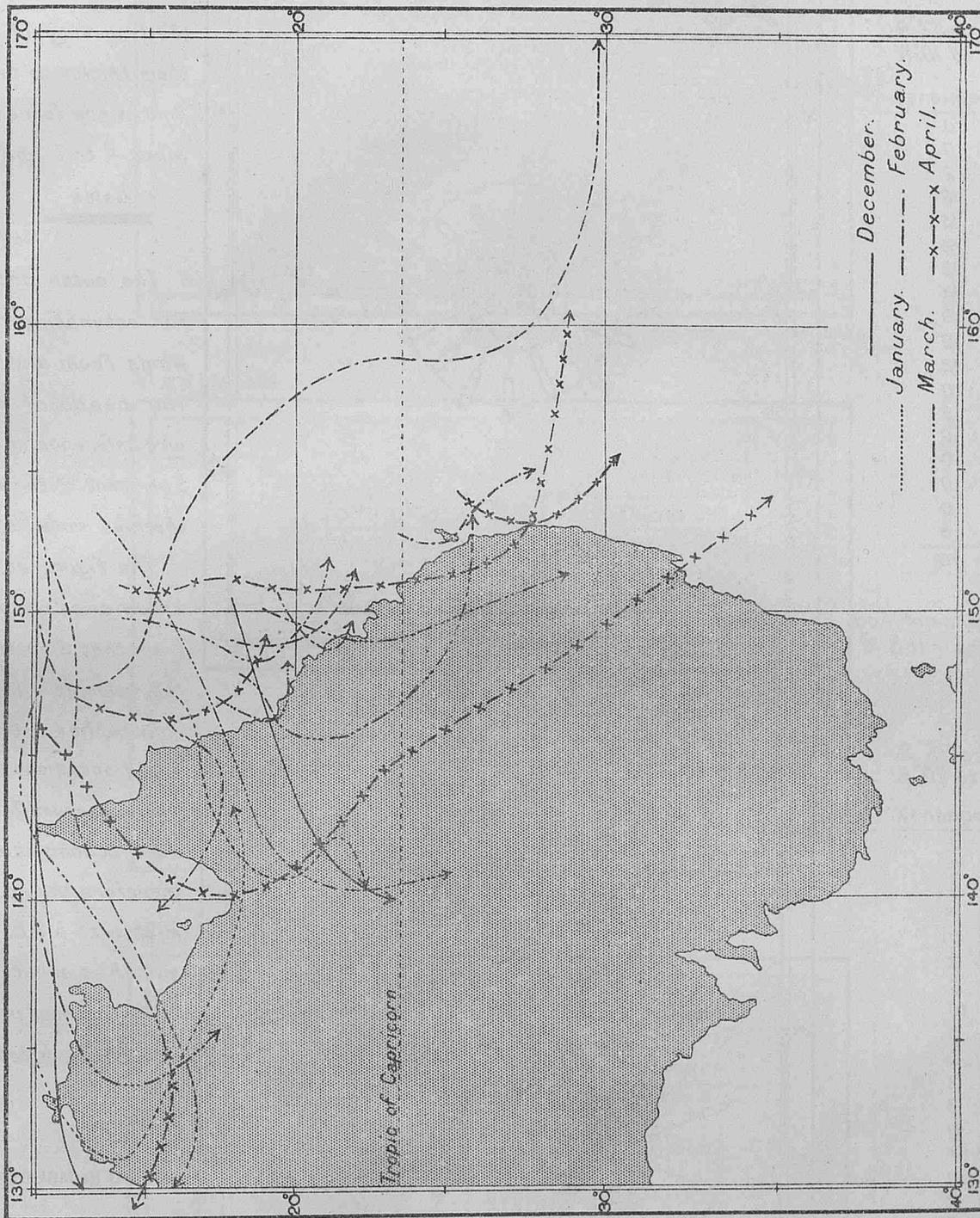


Chart B.—"South Pacific Hurricanes."

# OCTOBER.

## WIND, FOG AND MIST.

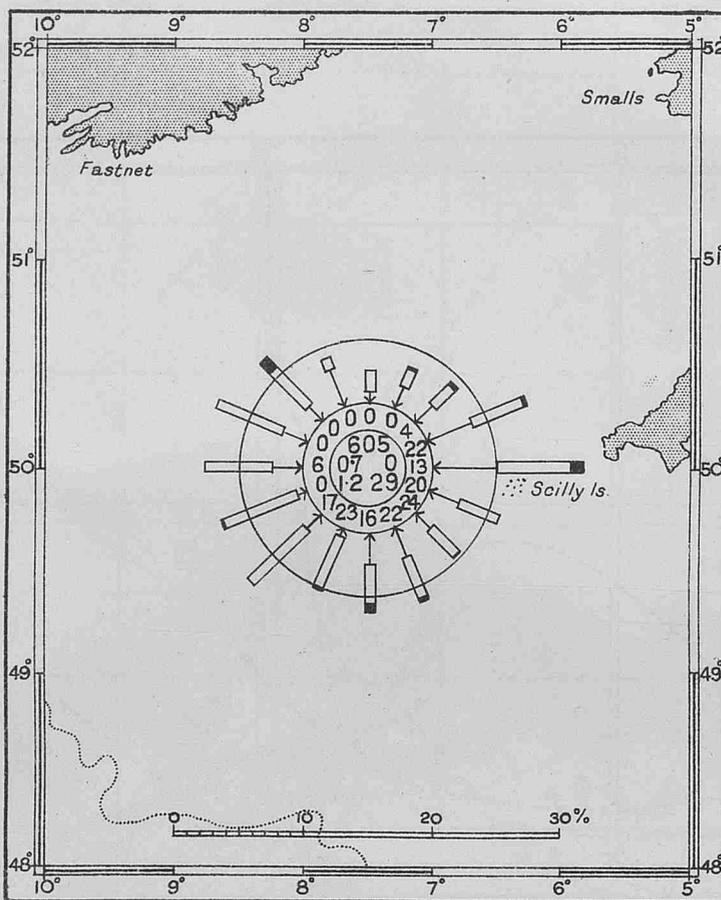
### S.W. Approaches to Great Britain and Ireland

Frequency of fog per thousand observations for each 2 points of compass, 1921 to 1928.

Latitude 48° to 52° N.  
Longitude 5° to 10° W.

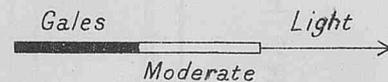
Direction.	Frequency.
N	0
NNE	0
NE	2
ENE	18
E	15
ESE	12
SE	15
SSE	13
S	10
SSW	12
SW	13
WSW	0
W	5
WNW	0
NW	0
NNW	0
Cal'm	0
Var.	3
<b>TOTAL</b>	<b>118</b>

Percentage Frequency of Fog and Mist for area = 11.8 %.



### EXPLANATION.

The arrows in the roses fly with the wind and show by their length the frequency of the winds and by their thickness the various forces, light winds forces 1 to 3, moderate winds 4 to 7 and gales 8 to 12.



The outer circle supplies a scale for estimating the frequency of winds from any direction. From the heads of the arrows to the circumference of the circle represents 5 per cent of the whole number of observed winds. (100 per cent = 10° longitude).

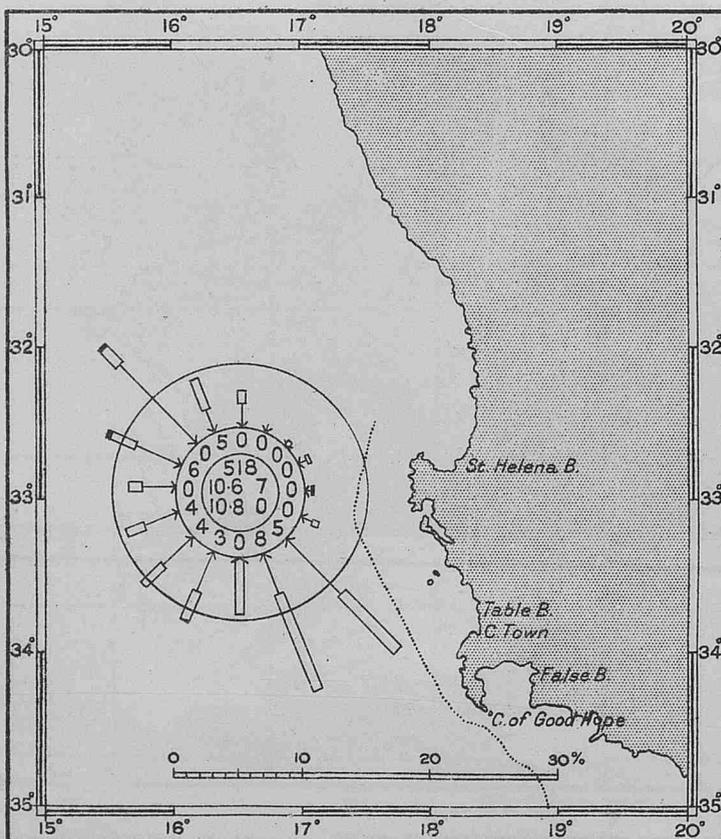
The figure at the head of the arrow gives the percentage of wind from that direction with fog or mist, for example:- In October in the S.W.

### Approaches to Table Bay.

Latitude 30° to 35° S.  
Longitude 15° to 20° E.

Direction.	Frequency.
N	0
NNE	0
NE	0
ENE	0
E	0
ESE	0
SE	6
SSE	10
S	0
SSW	2
SW	2
WSW	2
W	0
WNW	4
NW	0
NNW	2
Cal'm	8
Var.	0
<b>TOTAL</b>	<b>36</b>

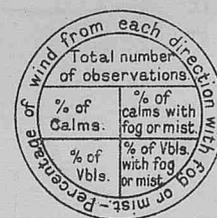
Percentage Frequency of Fog and Mist for area = 3.6 %.



Approaches to Great Britain & Ireland on all occasions when S.E.'ly winds were observed 24 per cent of them were accompanied with fog or mist, therefore the probability of fog or mist with a S.E. wind during this month is about 1 in 4.

Fog is most probable in this month with E.N.E. winds, the percentage being 1.8.

### KEY TO NUMBERS IN CENTRE OF ROSES.

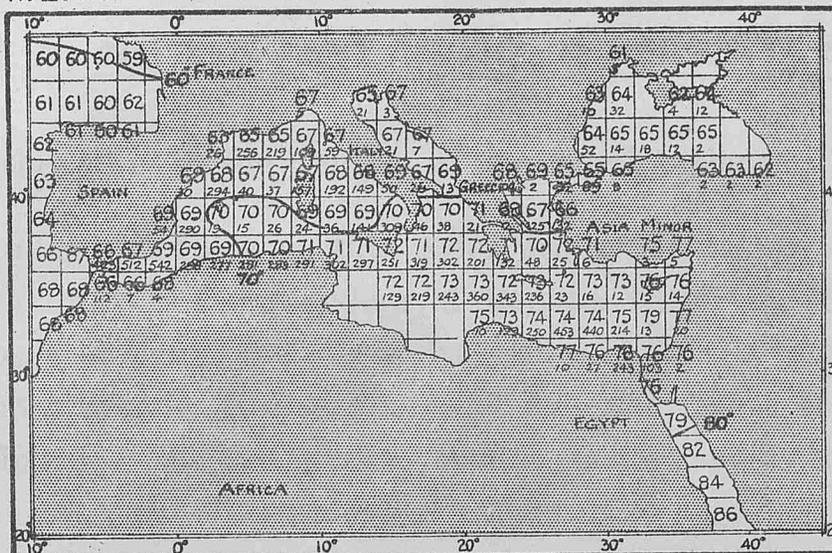


# MEDITERRANEAN SEA

## SEA SURFACE TEMPERATURES

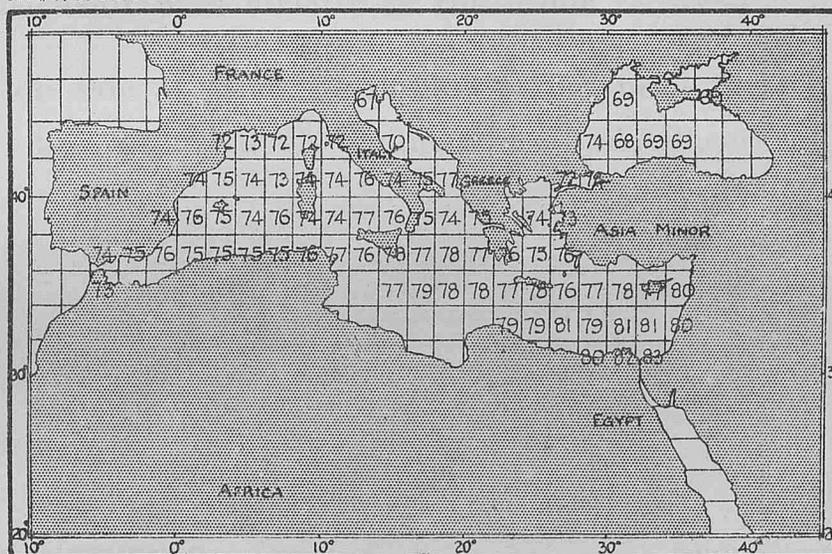
### OCTOBER.

MEAN.

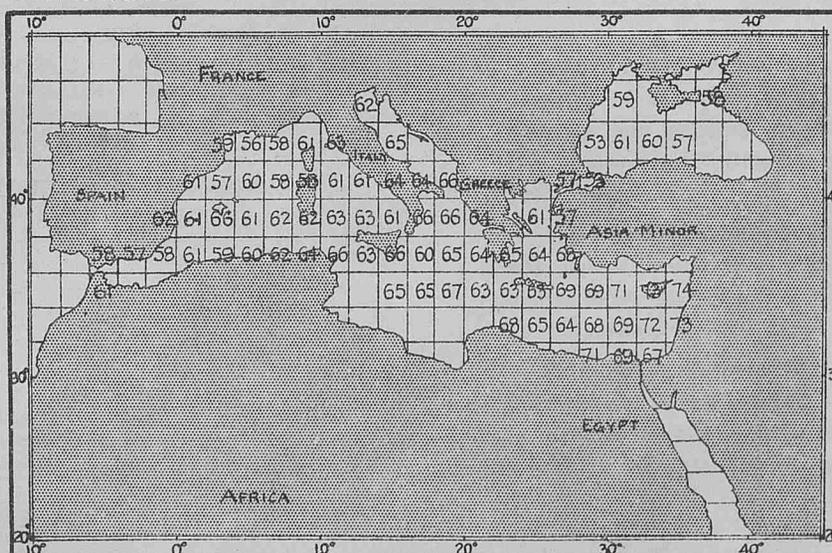


Small figure gives number of observations.

MAXIMUM.



MINIMUM.



Computed from observations of British Ships during the years 1900-1914 in the Mediterranean and Black Seas.

Maximum and Minimum figures are not shown unless the Mean Temperature has been computed from not less than 12 observations.

WENT



# NOTICES.

## NEW NORTH ATLANTIC CURRENT ATLAS.

Currents on the Main Trade Routes of the North Atlantic, M.O. 323.

A limited number of copies of this Atlas are available for supply as equipment of Regular Observing Ships. Commanders of Regular Observing Ships in the Fleet List in the Marine Observer using the routes English and St. Georges Channel to Gibraltar, Cape of Good Hope, Brazils, United States of America, West Indies and Panama, who wish to be equipped with this Atlas should make application in writing to the appropriate Agent or Port Meteorological Officer.

A limited number of copies only being available for issue to Observing Ships, applications will be dealt with strictly in the order received.

This Atlas is on sale at H.M. Stationery Office, price 6s. 6d., and Marine Observers are invited to call the attention of Commanders and Officers of ships not in the Fleet List to this fact.

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### POSTAL ARRANGEMENTS.

THE MARINE OBSERVER is published, when circumstances permit, on the first Wednesday of the month previous to that to which the number refers.

If captains of observing ships will forward to the Meteorological Office the particulars required hereunder, endeavour will be made as far as mails permit to post the latest number for use on their homeward passage.

S.S..... Captain.....

Port of Call.....

Date of Homeward Departure.....

Postal Address.....

When this information is not given THE MARINE OBSERVER is addressed to the Commanding Officer, s.s. ...., c/o the owners, and captains are requested to make their own arrangements for forwarding.

### DESPATCH OF INFORMATION REQUIRED IMMEDIATELY FOR THE CONDUCT OF THE WORK AT SEA.

Shipowners, Marine Superintendents and all concerned in the despatch of mails to Ships abroad are asked to kindly facilitate the despatch and delivery of postal matter received at their offices from the Meteorological Office and Air Ministry Publication Depot to their Ships abroad.

This matter addressed to the Commanders of Ships contains information which is required for the Conduct of Marine Meteorological Work at Sea and is most effective if received by the Commanders at the earliest possible date.

Much of the information referred to is published in the Marine Observer and is of a seasonal nature. This journal also contains advice to Regular Observing Ships which enables them to perform voluntary service by Wireless Communication for the benefit of all shipping.

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# ICE CHART.

## WESTERN NORTH ATLANTIC.

LETTERS OF TRANSATLANTIC TRACKS INDICATE.

- (C) From 1st September to 31st March, inclusive.
- (F) From 16th May to Opening of Belle Isle route and to 30th November when not using the Belle Isle route.
- (G) Westbound, on approaching Cape Race steer a course to pass 10 miles S. of Cape Race. Eastbound, steer from position 25 miles S. of Cape Race.
- (H) From the opening of the Straits of Belle Isle to 14th November.

These routes are liable to alteration when, owing to abnormal ice conditions, it is considered advisable by the steamship lines who are parties to the Track agreement.

### ROUTE NOTICES.

For latest information re Tracks see pages 89-90 of Vol. VII, No. 76, April, 1930, Number.

### SYMBOLS USED ON THE CHART.

- Iceberg.
- △ Floeberg.
- ▬ Growler.
- Field Ice, Floe Ice, Pack Ice, Hummocky Ice, Bay Ice.
- Drift Ice, Brash Ice, Sludge Ice, Pancake Ice.
- ⊕ Indicates W/T Ice Warning Station.

### PHENOMENAL POSITIONS OF ICE.

Date.	Ship or Source of Report.	Position.		Remarks.
		Lat.	Long.	
Oct. 15, 1883	S.S. Elenora	37°00' N.	18°00' W.	Piece ice.
" 8, 1912	S.S. Putney Bridge	35°15' N.	44°50' W.	Small berg/35 ft. long, 6 ft. high.
" 27, 1916	S.S. Montreal	51°17' N.	41°17' W.	Small berg.
" 2, 1918	U.S. Hyd., Bulletin	50°10' N.	40°50' W.	Large berg.
" 19, 1920	Do.	45°22' N.	40°09' W.	Berg.
" 17, 1921	S.S. Mt. Vernon	45°24' N.	40°07' W.	Berg.
" 6, 1922	S.S. Christian Krogh	48°23' N.	42°19' W.	Berg about 70 ft. high, 400 ft. long.
" 7, 1923	S.S. Eastern Dawn	50°43' N.	40°42' W.	Large growler about 100 ft. square.
" 23, 1927	Trawler, Grecian Empire.	30 mls. E.S.E. of Outer Skerries, Shetland Is.		Piece of ice 100 ft. long, 6 ft. above water.

Reports of Ice sighted between August 1st and August 31st, 1930, which have been received by the Meteorological Office, are shown by the Symbols plotted in the position reported, the figures indicating the day of the month.

### ICE IN GREENLAND WATERS.

SUMMARY OF INFORMATION FROM CABLEGRAM RECEIVED FROM DANISH METEOROLOGICAL INSTITUTE, COPENHAGEN.

August 19 ..... "Open ice 15 miles off Cape Farewell."

August 1st and August 31st, 1930, which have been received by the Meteorological Office, are shown by the Symbols plotted in the position reported, the figures indicating the day of the month.

## CO-OPERATION OF SHIPOWNERS, MASTERS AND MATES.

Captains and officers who wish to co-operate regularly with the Meteorological Office should apply by letter to The Director, Meteorological Office, Air Ministry, Kingsway, London, W.C.2, or in person to the Marine Superintendent at the same address, or any of the gentlemen whose names and addresses appear below, acting as agents at the respective ports. A general description of Marine Meteorological Work, including the particulars desired from intending Marine Observers, is given in Chapter I of THE MARINE OBSERVER'S HANDBOOK, 5TH EDITION, which may be obtained from H.M. Stationery Office direct, or through any bookseller, price 2s. 6d.

The names of vessels regularly observing for the Meteorological Office, London, together with their Commanders and Observing Officers, are given monthly in THE MARINE OBSERVER, which may be obtained from H.M. Stationery Office, price 2s., 2s. 2d. post free.

The Captains and Officers of regular observing ships constitute the Corps of Voluntary Marine Observers. For certain branches of this work tested instruments are lent to the Captains of British ships registered at ports in Great Britain. A certain number of Regular Observing ships are detailed as "Selected Ships" for the purpose of the World Wide Scheme of Routine Ships' Wireless Weather Telegraphy Reporting. These "Selected Ships" are indicated monthly in the "Fleet List" in THE MARINE OBSERVER by a number.

Only ships registered at Ports in Great Britain will, in future, be included in the Meteorological Office, London, "Fleet List."

Marine Observers are asked to send in their Meteorological Log through the appropriate Port Meteorological Officer or Agent (accompanied by Form 138 in the case of "Selected Ships") at intervals of not more than six months. The Meteorological Record Form 911 (accompanied by Form 138 in the case of "Selected Ships") should be posted direct to the Meteorological Office, London, at the end of each voyage.

When sending in the Meteorological Log or Record, Regular Observing ships will render great assistance if they will notify the Port Meteorological Officer or Agent of their requirements.

The Port Meteorological Officers and Agents inspect official instruments at regular intervals, replacing those which are defective.

Where ships' instruments are found by comparison to be reliable they may be used for the work of "Selected Ships." A reliable mercurial barometer is essential as part of the equipment of a "Selected Ship."

A copy of THE MARINE OBSERVER is sent monthly to the Captain of every observing ship for the information and guidance of the officers doing this work. He is also supplied with THE MARINE OBSERVER'S HANDBOOK and such charts and atlases as are considered necessary as Meteorological equipment for The Work of a Regular Observing ship in a particular trade.

WIRELESS AND WEATHER AN AID TO NAVIGATION, published by H.M. Stationery Office, which affords information and guidance for the practical application of Marine Meteorology to Navigation, may be purchased through any bookseller, price 5s.

Returns made by Regular Observing ships are acknowledged monthly in THE MARINE OBSERVER, and a list of those Commanders and Officers who have performed specially fine work is published yearly in THE MARINE OBSERVER and Excellent Awards are made to them.

The work done by Regular Observing Ships in making written returns, and by "Selected Ships" in broadcasting routine information by W/T, together with "Weather Shipping" Bulletins broadcast from the shore, conforming with the recommendations of the International Convention of Safety of Life at Sea, 1929, provide the necessary information for the use of all shipping. Thus by shipowners encouraging the specialist work in those of their ships whose names appear in THE MARINE OBSERVER, this Voluntary Work under the supervision of the Meteorological Office provides a service to all shipping at minimum cost to the National funds.

Shipowners are asked to facilitate the forwarding of postal matter from the Air Ministry addressed to the Captains of their ships:

## NAUTICAL OFFICERS AND AGENTS OF THE MARINE DIVISION OF THE METEOROLOGICAL OFFICE, AIR MINISTRY.

LONDON ... Captain L. A. BROOKE SMITH, R.D., R.N.R., Marine Superintendent.  
Commander J. HENNESSY, R.D., R.N.R., Senior Nautical Assistant.  
Room 319, Adastral House, Kingsway, W.C.2.  
(Telephone No.: Holborn 3434 Extension 421).  
Nearest station Temple, District Railway.

THAMES ... Lieut. C. H. WILLIAMS, R.N.R., Port Meteorological Officer, Royal Albert Docks, E.16.  
(Telephone No.: Albert Docks 2659. Telegraphic Address: Barometric Aldock, London).

MERSEY ... Lieut. Commander M. CRESSWELL, R.N.R., Port Meteorological Officer, Dock Office, Liverpool.  
(Telephone No.: Bank 8959. Telegraphic Address: Meteorite, Liverpool).

## Agents.

BELFAST ... Captain J. MCINTYRE, Harbour Master, Harbour Office. (Telephone No.: Belfast 4090).  
CARDIFF ... Captain T. JOHNSTON, Technical College, Cathays Park. (Telephone No.: Cardiff 6813).  
CLYDE ... Mr. ROBERT CLEARY, Master Mariner, The Clutha Stevedoring Co., Ltd., Princes Dock, Glasgow. (Telephone No.: 513 Ibrox).  
FREMANTLE ... Captain J. J. AIREY, Deputy Director of Navigation, Customs House.  
W. Australia. (Telephone No.: B 1391).

## LATE PRESS.

## DERELICTS AND FLOATING WRECKAGE.

Date.	Position.		Description.
	Latitude.	Longitude.	
<b>ENGLISH CHANNEL.</b>			
23.8.30	C. de Hague Lt. H. bearing N62°E. Alderney Lt. H. bearing N28°W.		Red conical buoy, dangerous.
<b>NORTH ATLANTIC.</b>			
2.8.30	40°22'N.	61°51'W.	Large red gas buoy with staff and flag, showing irregular flashing white light with fixed red light below.
3.8.30	41°48'N.	68°15'W.	Wreckage nearly submerged about 40 ft. long and 4 ft. wide.
3.8.30	34°41'N.	74° - 'W.	Wooden object partly submerged, red buoy and drum nearby.
3.8.30	43°27'N.	37°29'W.	Rusty cylindrical iron drum.
4.8.30	38°08'N.	73°46'W.	Light buoy with lantern, painted red.
7.8.30	25°20'N.	68°19'W.	Spar about 50 feet long.
12.8.30	38°11'N.	37°03'W.	Tree stumps projecting about 12 feet out of water.
12.8.30	33°13'N.	42°27'W.	Large red, conical buoy.
18.8.30	46°23'N.	6°51'W.	Red spherical buoy surmounted by a metallic mark.
23.8.30	49°33'N.	17°20'W.	Large red and black painted buoy floating on its side, dangerous.
25.8.30	49°25'N.	16°30'W.	Buoy adrift with letter S on side, broken framework on top.
25.8.30	46°48'N.	7°35'W.	White painted derrick, dangerous.
<b>GULF OF MEXICO.</b>			
5.8.30	25°21'N.	84°18'W.	Spar buoy projecting about 4 feet out of water, covered marine growth.
<b>NORTH PACIFIC.</b>			
5.8.30	8°21'N.	79°36'W.	Derelict 10 ton vessel Rosa Isabel awash.
6.8.30	36°43'N.	122°18'W.	Log about 60 feet long.
8.8.30	36°02'N.	121°44'W.	Log about 60 feet long, 2 feet diameter.
10.8.30	33°11'N.	117°44'W.	Fishing schooner on fire.

## Agents (contd.).

HONG KONG, China. Lieut. Commander R. G. H. MILLIGAN, R.N., Superintendent, Admiralty Chart and Chronometer Depot, H.M. Dockyard.  
(Telephone No.: 108 Dockyard).

HULL ... Captain A. M. BROWN, Ellerman Wilson Line Office. (Telephone No.: Central 2180).

LEITH ... Captains G. BLACK and C. G. BONNER, V.C., D.S.C., Leith Salvage and Towage Co., Ltd., 2, Commercial Street.

SOUTHAMPTON Captain D. FORBES, Nautical Academy, 1, Albion Place.

SYDNEY, New South Wales. Commander G. D. WILLIAMS, D.S.O., R.D., R.N.R., Deputy Director of Navigation.

Captain C. LINDBERGH.

Customs House.  
(Telephone No.: B6421).

TYNE ... Captain J. J. MCEWAN, Marine School, South Shields.

VANCOUVER, British Columbia. Mr. T. S. H. SHEARMAN, 61, Leigh Spencer Building, 553, Granville Street.  
(Telephone No.: Seymour 3309).